Instructions

hp StorageWorks Enterprise Virtual Array

Updating Product Software

VCS Version: 3.014

Command View EVA Version: 3.1

Sixth Edition (May 2004)

Part Number: AA-RS29E-TE

This document contains the necessary procedures to update the product software for the HP StorageWorks Enterprise Virtual Array. This document outlines the proper upgrade process and includes detailed installation instructions for Enterprise Virtual Array product software, such as HP OpenView Storage Management Appliance software, HP StorageWorks Command View EVA, and HP StorageWorks Virtual Controller Software.

For the latest version of these Instructions and other Enterprise Virtual Array documentation, access the HP storage website at: http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html.

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Enterprise Virtual Array Updating Product Software Instructions
Sixth Edition (May 2004)
Part Number: AA-RS29E-TE

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about this guide

This guide provides information to help you:

- Upgrade the Storage Management Appliance software, Command View EVA, and Virtual Controller Software.
- Downgrade the Virtual Controller Software.

This guide does not provide information about upgrading or changing the Enterprise Virtual Array hardware.

“About this Guide” topics include:

Conventions

Conventions consist of the following:

- Document Conventions
- Text Symbols
- Equipment Symbols

Document Conventions

The document conventions included in Table 1 apply in most cases.

Table 1: Document Conventions

Element	Convention
Cross-reference links	Blue text: Figure 1
Key and field names, menu items, buttons, and dialog box titles	**Bold**
File names, application names, and text emphasis	*Italics*
User input, command and directory names, and system responses (output and messages)	`Monospace font` `COMMAND NAMES` are uppercase monospace font unless they are case sensitive
Variables	*`<monospace, italic font>`*
Website addresses	Blue, underlined sans serif font text: http://www.hp.com

Text Symbols

The following symbols may be found in the text of this guide. They have the following meanings:

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.

Caution: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

Note: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Equipment Symbols

The following equipment symbols may be found on hardware to which this guide pertains. They have the following meanings:

These symbols mark an enclosed surface or area of the equipment and indicate the presence of electrical shock hazards. The enclosed area contains no operator serviceable parts.

WARNING: To reduce the risk of personal injury from electrical shock hazards, do not open this enclosure.

These symbols indicate that the marked RJ-45 receptacle is a network interface connection.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

These symbols indicate that the marked surface or area of equipment has a hot surface or hot component. Contact with this surface could result in injury.

WARNING: To reduce the risk of personal injury from a hot component, allow the surface to cool before touching.

These symbols mark power supplies and systems and indicate the presence of multiple sources of power.

WARNING: To reduce the risk of personal injury from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.

These symbols indicate that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manually handling material.

Rack Stability

Rack stability protects personnel and equipment.

WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- In single rack installations, the stabilizing feet are attached to the rack.
- In multiple rack installations, the racks are coupled.
- Only one rack component is extended at any time. A rack may become unstable if more than one rack component is extended for any reason.

Getting Help

If you still have a question after reading this guide, contact an HP authorized service provider or access our website:
http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html

HP Technical Support

Telephone numbers for worldwide technical support are listed on the following HP website: http://www.hp.com/support/. From this website, select the country of origin.

Note: For continuous quality improvement, calls may be recorded or monitored.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

HP Storage Website

The HP website has the latest information on this product, as well as the latest drivers. Access storage at: http://www.hp.com/country/us/eng/prodserv/storage.html. From this website, select the appropriate product or solution.

HP Authorized Reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP website for locations and telephone numbers: http://www.hp.com.

Getting Started

1

This chapter provides information about required kits and documentation, in addition to the intended audience. Please ensure that you have met the outlined requirements and possess all of the required materials, before you begin the installation procedures outlined in this guide.

This chapter includes the following topics:

Note: Use Appendix B: Software Version Worksheet to collect important version information as you read through this manual and perform the procedures.

Intended Audience

This document is intended for customers who need to upgrade the StorageWorks Enterprise Virtual Array (EVA) from v2.003 (or higher) to v3.014.

Note: You should read the entire guide before beginning any procedure.

Before performing the procedures in this manual, you should be familiar with the following:

- HP StorageWorks Enterprise Virtual Arrays
- SANs and storage systems
- HP StorageWorks Command View EVA
- HP OpenView Storage Management Appliance and HP OpenView Storage Management Appliance software

Note: HP recommends that you review the documentation listed in Table 2 on page 14 to familiarize yourself with the various hardware and software components.

For the latest version of these Instructions and other Enterprise Virtual Array 5000 (EVA5000) documentation, access the EVA5000 documentation website at: http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html.

For the latest version of Enterprise Virtual Array 3000 (EVA3000) documentation, access the EVA3000 website at: http://h18006.www1.hp.com/products/storageworks/eva3000/index.html and click **technical documentation**.

During the upgrade process, you install software on the Storage Management Appliance and the HSV controllers. You will be using the Storage Management Appliance software, Command View EVA, and the Operator Control Panel (OCP) on the HSV controller.

HP recommends that you review the documentation listed in Table 2 to familiarize yourself with the various hardware and software components.

Table 2: Related Documentation

To Read About...	Refer To...	Location
HSV110 controller	HP StorageWorks Enterprise Virtual Array User Guide (EK-E2USR-UA.C01)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html OR Documentation for Enterprise Virtual Array 5000 v3.010 CD (T3030-10103)
HSV100 controller	HP StorageWorks Enterprise Virtual Array 3000 User Guide (EK-EVA30-UG.B01)	http://h18006.www1.hp.com/products/storageworks/eva3000/index.html and click **technical documentation**.

Table 2: Related Documentation (Continued)

To Read About...	Refer To...	Location
Storage Management Appliance software v2.1	HP OpenView Storage Management Appliance Software User Guide (AA-RS0AD-TE)	http://h18006.www1.hp.com/products/sanworks/managementappliance/documentation.html
Command View EVA v3.1	HP StorageWorks Command View EVA Getting Started Guide (AA-RQZBF-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
	Command View EVA Interactive Help File (AA-RPKKF-TE)	Installed with the Command View EVA application.

Prerequisites

This section lists the required tools for successful upgrades and downgrades of the software in the Enterprise Virtual Array.

This section includes the following topics:

For information about software compatibility, please see Chapter 2: Software Compatibility Matrices.

Note: Before you can perform an online upgrade to Virtual Controller Software (VCS) v3.014, you must be running VCS v2.003 (or higher) on the HSV controllers. If you need assistance in upgrading to VCS v2.003, please refer to *SANworks by Compaq Upgrade Instructions for Enterprise Virtual Array v2.0* or contact an HP Authorized Service Representative.

Required Kits

Before you begin the Enterprise Virtual Array v3.014 upgrade procedure, you must have the following kits:

- HP StorageWorks Virtual Controller Software v3.014

  Request VCS v3.014 from your HP Authorized Service Representative.

- ***HP OpenView Storage Management Appliance Software v2.1*** kit (222799-B26)

  In addition to documentation, this kit contains the following:

  — HP OpenView Storage Management Appliance Software v2.1 CD

  This CD can also be obtained from the following website: http://h18000.www1.hp.com/products/sanworks/softwaredrivers/managementappliance/index.html

- ***HP OpenView Storage Operations Manager v1.0 Media and Documentation*** kit (T2538AA)

  In addition to documentation, this kit contains the following:

  — *HP StorageWorks Command View EVA v3.1* CD (T2538-15000)

  This CD contains the following:

  — Command View EVA v3.1

  — HP StorageWorks SMI-S EVA v1.01

  — *HP OpenView Storage Area Manager v3.0 Software* CD (J5364-15001)

  This CD contains HP OpenView Storage Node Manager.

Note: Storage Node Manager is part of the HP OpenView Storage Area Manager (OV SAM) product suite. The HP OpenView Storage Operations Manager v1.0 Media and Documentation kit contains an evaluation copy of Storage Area Manager v3.0.

- Host server kits

  Depending on your host platforms, you might require one or more of the following kits:

  — HP StorageWorks HP-UX Kit V3.0D for Enterprise Virtual Array
  — HP StorageWorks IBM AIX Kit V3.0D for Enterprise Virtual Array
  — HP StorageWorks Linux Kit V3.0D for Enterprise Virtual Array
  — HP StorageWorks Novell NetWare Kit V3.0D for Enterprise Virtual Array
  — HP StorageWorks OpenVMS Kit V3.0D for Enterprise Virtual Array
  — HP StorageWorks Sun Solaris Kit V3.0D for Enterprise Virtual Array
  — HP StorageWorks Tru64 Kit V3.0D for Enterprise Virtual Array
  — HP StorageWorks Windows Kit V3.0D for Enterprise Virtual Array

  You can download the appropriate host server kits from the following website:

  http://www.hp.com/go/evaplatformkit/

Recommended Browsers and Java™ Runtime Environments

Table 3 lists the recommended browsers for running Storage Management Appliance software v2.1 and Command View EVA v3.1.

Note: You should update your Internet browser version on your remote computers **after** you have upgraded to Storage Management Appliance software v2.1 and Command View EVA v3.1.

If you use browser and JRE versions that are not listed in Table 3, the Storage Management Appliance software v2.1 and Command View EVA v3.1 applications may not work correctly in your browser.

Table 3: Recommended Browsers and JREs

Operating System	Internet Browser	Java Runtime Environment (JRE)
HP-UX 11i, 11.23,	Netscape Navigator 7.0	1.4.1_02
Red Hat Linux AS 2.1 (32-bit)	Netscape Navigator 7.02	1.4.1_03
Sun Solaris™ 8, 9	Netscape Navigator 7.0	1.4.1_03
Windows® 2000 SP3	Internet Explorer 6.0 SP1	1.4.1_03
Windows NT® v4.0 SP6a	Internet Explorer 6.0 SP1	1.4.1_03
Windows Server 2003 (IA32)	Internet Explorer 6.0 v6.00.3790.000	1.4.1_03

Required Licenses

Estimated Time to Complete

1 to 48 hours

Depending on the functionality you require and your Enterprise Virtual Array type, Command View EVA v3.1 might require the following licenses:

- HP StorageWorks Business Copy eva5000 v2.2, v3.0 license
- HP StorageWorks Business Copy eva3000 v2.2, v3.0 license
- HP StorageWorks Continuous Access eva5000 v1.1, v1.0 license
- HP StorageWorks Continuous Access eva3000 v1.1, v1.0 license

See Table 8 on page 26 for more information about element manager software and add-on license compatibility.

If you intend to use either Business Copy EVA v2.2 or Continuous Access EVA v1.1 after you have upgraded to Command View EVA v3.1, you must obtain the appropriate licenses. You must obtain the appropriate licenses before you begin the upgrade procedure described in Chapter 3: Upgrading the Enterprise Virtual Array to v3.014.

See the *HP StorageWorks Business Copy EVA License Instructions* and the *HP StorageWorks Continuous Access EVA V1.1 Getting Started Guide* for more information about obtaining licenses for Business Copy EVA v2.2 and Continuous Access EVA v1.1, respectively.

Note: Redeeming licenses can take between 1 and 48 hours. Please plan accordingly.

Antivirus Software

After you upgrade to Storage Management Appliance software v2.1, you can install an antivirus application. HP supports the use of the following antivirus programs:

- Symantec Norton AntiVirus v7.6 and v8.0—Corporate Edition
- McAfee NetShield v4.5
- McAfee VirusScan Enterprise v7.0
- Trend Micro ServerProtect v5.31 and v 5.5
- eTrust InoculateIT v6.0

Please refer to *OpenView HP Storage Management Appliance Software Using AntiVirus Software Application Notes*. This document provides instructions for using current versions of the above antivirus applications.

Reference Documentation

Table 4 lists the documents to which you might refer during the upgrade and downgrade processes. The listed URL is the best place to obtain the latest version of each document.

Table 4: Reference Documents

Title	Location
HP OpenView Migrating Storage Resource Manager, Storage Allocation Reporter, and Network View to Storage Area Manager Application Notes (AA-RTDPA-TE)	http://h71025.www7.hp.com/support/reference_library/viewdocument.asp?countrycode=1000&prodid=117&source=AA-RTDPA-TE.xml&dt=14&docid=17125 Then, click **Download**.
HP OpenView Storage Area Manager 3.0 Installation Guide	http://h18006.www1.hp.com/products/storage/software/sam/documentation.html
HP OpenView Storage Area Manager EVA Device Plug-In Installation Instructions	http://openview.hp.com/products/dpi/install_guides/HP_HSVdpi_03_00_E.pdf
HP OpenView Storage Management Appliance Software Update Installation Card (AV-RNE9K-TE)	http://h18006.www1.hp.com/products/sanworks/managementappliance/documentation.html
HP OpenView Storage Management Appliance Software Using AntiVirus Software Application Notes (AA-RTD3B-TE)	http://h18006.www1.hp.com/products/sanworks/managementappliance/documentation.html
HP StorageWorks Business Copy EVA License Instructions (AV-RVJGA-TE)	Available in the Business Copy EVA license kits.
HP StorageWorks Business Copy EVA/MA/EMA Host Agent v2.2 for HP OpenVMS Installation Guide	http://h18006.www1.hp.com/products/storage/software/bizcopyeva/index.html Then, click **technical documentation**.
HP StorageWorks Business Copy EVA/MA/EMA Host Agent v2.2 for HP Tru64 UNIX Installation Guide	http://h18006.www1.hp.com/products/storage/software/bizcopyeva/index.html Then, click **technical documentation**.
HP StorageWorks Business Copy EVA/MA/EMA Host Agent v2.2 for HP-UX Installation Guide	http://h18006.www1.hp.com/products/storage/software/bizcopyeva/index.html Then, click **technical documentation**.
HP StorageWorks Business Copy EVA/MA/EMA Host Agent v2.2 for IBM AIX Installation Guide	http://h18006.www1.hp.com/products/storage/software/bizcopyeva/index.html Then, click **technical documentation**.
HP StorageWorks Business Copy EVA/MA/EMA Host Agent v2.2 for Sun Solaris Installation Guide	http://h18006.www1.hp.com/products/storage/software/bizcopyeva/index.html Then, click **technical documentation**.
HP StorageWorks Business Copy EVA/MA/EMA Host Agent v2.2 for Windows Installation Guide	http://h18006.www1.hp.com/products/storage/software/bizcopyeva/index.html Then, click **technical documentation**.
HP StorageWorks Business Copy EVA/MA/EMA Server v2.2 Installation Guide	http://h18006.www1.hp.com/products/storage/software/bizcopyeva/index.html Then, click **technical documentation**.

Table 4: Reference Documents (Continued)

Title	Location
HP StorageWorks Business Copy EVA/MA/EMA v2.2 Using BC with Continuous Access EVA and Data Replication Manager Application Notes (T3032–96108)	http://h18006.www1.hp.com/products/storage/software/bizcopyeva/index.html Then, click **technical documentation**.
HP StorageWorks Continuous Access EVA V1.1 Getting Started Guide (T3031-96201)	http://h18006.www1.hp.com/products/storage/software/conaccesseva/index.html Then, click **technical documentation**.
HP StorageWorks Continuous Access User Interface V1.1a Installation Guide	http://h18006.www1.hp.com/products/storage/software/conaccesseva/index.html Then, click **technical documentation.**
HP StorageWorks SMI-S EVA V1.01 Installation Instructions (AA-RUQFA-TE)	http://h18006.www1.hp.com/products/sanworks/managementappliance/documentation.html
SANworks by Compaq Upgrade Instructions for Enterprise Virtual Array v2.0 (AA-RS29A-TE)	http://h71025.www7.hp.com/support/reference_library/viewdocument.asp?countrycode=1000&prodid=117&source=AA-RS29A-TE.xml&dt=14&docid=17429
Host Server Documentation	
HP StorageWorks HP-UX Kit V3.0B for Enterprise Virtual Array Installation and Configuration Guide (AA-RUHKB-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks HP-UX Kit V3.0D for Enterprise Virtual Array Release Notes (AV-RUHNC-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks IBM AIX Kit V3.0B for Enterprise Virtual Array Installation and Configuration Guide (AA-RUHAB-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks IBM AIX Kit V3.0D for Enterprise Virtual Array Release Notes (AV-RUHDC-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks Linux Kit V3.0C for Enterprise Virtual Array Installation and Configuration Guide (AA-RUHVC-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks Linux Kit V3.0D for Enterprise Virtual Array Release Notes (AV-RUHYD-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks Novell NetWare Kit V3.0C for Enterprise Virtual Array Installation and Configuration Guide (AA-RUHQC-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks Novell NetWare Kit V3.0D for Enterprise Virtual Array Release Notes (AV-RUHTD-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks OpenVMS Kit V3.0B for Enterprise Virtual Array Installation and Configuration Guide (AA-RUGUB-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks OpenVMS Kit V3.0D for Enterprise Virtual Array Release Notes (AV-RUGXC-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks Sun Solaris Kit V3.0B for Enterprise Virtual Array Installation and Configuration Guide (AA-RUH4B-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html

Table 4: Reference Documents (Continued)

Title	Location
HP StorageWorks Sun Solaris Kit V3.0D for Enterprise Virtual Array Release Notes (AV-RUH7D-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks Tru64 Kit V3.0B for Enterprise Virtual Array Installation and Configuration Guide (AA-RUGPB-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks Tru64 Kit V3.0D for Enterprise Virtual Array Release Notes (AV-RUGSC-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks Windows Kit V3.0B for Enterprise Virtual Array Installation and Configuration Guide (AA-RUGZB-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html
HP StorageWorks Windows Kit V3.0D for Enterprise Virtual Array Release Notes (AV-RUH2C-TE)	http://h18006.www1.hp.com/products/storageworks/enterprise/documentation.html

Software Compatibility Matrices

2

The Enterprise Virtual Array uses various software that work with each other to manage the storage solution. When you are considering an upgrade, it is important to ensure that all of the software and firmware versions are compatible.

This section provides tables that summarize which versions of software are compatible with each other. Use Table 5, Table 6, Table 7, and Table 8 to ensure that you are using compatible software versions.

Note: Use Appendix B: Software Version Worksheet to collect important version information as you read through this manual and perform the procedures.

The HP StorageWorks Command View EVA v3.1 software is compatible with the following:

Software

- HP StorageWorks Virtual Controller Software (VCS) v3.014 (recommended version)
- HP OpenView Storage Management Appliance software v2.1 (required)

Hardware

- HP OpenView Storage Management Appliance I, II, or III
- HSV110 controller (EVA5000)
- HSV100 controller (EVA3000)

Note: Refer to the release notes for the host operating system to determine which version of HP StorageWorks Secure Path (and service packs) you should use. (See Table 4 on page 19 for a list of host server documents.)

Table 5 indicates the compatible versions of element manager software and storage system software. Command View EVA v3.1 is compatible with several versions of VCS; however, the recommended VCS version is VCS v3.014. If you are running a version of VCS that is not listed in this table (for instance, VCS v1.01), you should upgrade to a later version of VCS.

Caution: After you have upgraded a storage system to v3.000 (or higher), you should not downgrade the initialized storage system to v2.xxx. If you attempt to downgrade an initialized storage system, you will lose any configuration information or data in that storage system. All existing data will be destroyed when you downgrade from v3.xxx to v2.003 (or higher).

See Table 12 on page 67 for a description of the proper storage system software upgrade paths.

Table 5: Element Manager Software and Storage System Software Compatibility

Storage System Software Version	HSV Element Manager v2.0a	Command View EVA v2.1	Command View EVA v3.0	Command View EVA v3.0a	Command View EVA v3.1
VCS v2.002	Yes	Yes	Yes	Yes	Yes
VCS v2.003	No	Yes	Yes	Yes	Yes
VCS v2.004	No	Yes	Yes [1]	Yes [1]	Yes [1]
VCS v2.005	No	Yes	Yes	Yes	Yes
VCS v2.006	No	Yes	Yes	Yes	Yes
VCS v3.000	No	No	Yes [2]	Yes [2]	Yes [2]
VCS v3.001	No	No	Yes	Yes	Yes
VCS v3.010	No	No	No [3]	No [3]	Yes
VCS v3.014	No	No	No	No	Yes

1 VCS v2.004 is compatible only with EVA3000.
2 VCS v3.000 cannot be used on an EVA3000 system.
3 While Command View EVA v3.0 and v3.0a can manage controllers running VCS v3.014, you will not have access to any v3.014-specific features. HP requires that you upgrade to Command View EVA v3.1.

Table 6 indicates the compatible versions of VCS and Enterprise Virtual Array. The EVA3000 storage system uses the HSV100 controller, and the EVA5000 storage system uses the HSV110 controller.

Table 6: Enterprise Virtual Array Type and VCS Compatibility

	EVA3000	EVA5000
VCS v2.002	No	Yes
VCS v2.003	No	Yes
VCS v2.004	Yes	No
VCS v2.005	Yes	Yes
VCS v2.006	Yes	Yes
VCS v3.000	No	Yes
VCS v3.001	No	Yes
VCS v3.010	Yes	Yes
VCS v3.014	Yes	Yes

Table 7 indicates the compatible versions of element manager software and Storage Management Appliance software. Command View EVA v3.1 is compatible with the Storage Management Appliance software v2.1. If you are running Storage Management Appliance software v1.0c or Storage Management Appliance software v2.0, you must upgrade the Storage Management Appliance software to v2.1.

See "Step 3: Upgrading the Storage Management Appliance" on page 38 for a description of the proper upgrade paths.

Table 7: Element Manager Software and Storage Management Appliance Software Compatibility

Storage Management Appliance Software	HSV Element Manager v2.0a	Command View EVA v2.1	Command View EVA v3.0	Command View EVA v3.0a	Command View EVA v3.1
v1.0C	Yes	No	No	No	No
v2.0	Yes	Yes *requires Service Pack 1a.	Yes *requires Service Pack 3.	Yes *requires Service Pack 4	No
v2.1	No	No	No	Yes	Yes

Table 8 indicates the compatible versions of the element manager software and add-on licenses such as, Business Copy EVA and Continuous Access EVA. Business Copy EVA and Continuous Access EVA add data management functionality.

Table 8: Element Manager Software and Add-on Licenses Compatibility

	Command View EVA v2.1	Command View EVA v3.0	Command View EVA v3.0a	Command View EVA v3.1 v3.1a
Business Copy eva5000 v2.1a	Yes	Yes	No	No
Business Copy eva5000 v2.2	No	Yes [1]	Yes [1]	Yes [1]
Business Copy eva3000 v2.1	Yes	No	No	No
Business Copy eva3000 v2.1a	No	Yes	No	No
Business Copy eva3000 v2.2	No	No	Yes	Yes
Continuous Access eva5000 v1.0	No	Yes	Yes	No
Continuous Access eva5000 v1.1	No	No	No	Yes
Continuous Access eva3000 v1.1	No	No	No	Yes

1 Business Copy eva5000 v2.2 is compatible only with VCS v2.003, VCS v2.005, VCS v3.000, and VCS v3.010.

Upgrading the Enterprise Virtual Array to v3.014

3

Upgrading from Enterprise Virtual Array v3.0 to v3.014 involves several steps, which must be done in the prescribed order. If you do not perform the upgrade process in the appropriate order, you may not be able to manage the Enterprise Virtual Array storage system using Command View EVA.

Note: Refer to Appendix A: Software Upgrade Flowchart for a graphical overview of the upgrade process.

Use Appendix B: Software Version Worksheet to collect important version information as you read through this manual and perform the procedures.

HP highly recommends that you perform this upgrade procedure during off-peak hours. The upgrade process may cause a fully configured HSV controller to exceed application-specific timeout values. During the VCS upgrade, both HSV controllers reboot at the same time.

Note: Before you can perform an online upgrade to VCS v3.014, you must be running VCS v2.003 (or higher) on the HSV controllers. If you need assistance in upgrading to VCS v2.003, please refer to *SANworks by Compaq Upgrade Instructions for Enterprise Virtual Array* V2.0 or contact an HP Authorized Service Representative.

The upgrade procedure contains the following steps:

Caution: After you have upgraded a storage system to v3.000 (or higher), you should not downgrade the initialized storage system to v2.xxx. If you attempt to downgrade an initialized storage system, you will lose any configuration information or data in that storage system. All existing data will be destroyed when you downgrade from v3.xxx to v2.003 (or higher).

Step 1: Checking the Health of the Enterprise Virtual Array

Estimated Time to Complete

1 hour

Before you upgrade your Enterprise Virtual Array to v3.014, you should check the condition of your storage system. Perform the following steps to determine if your Enterprise Virtual Array is in good condition and ready to upgrade.

1. Check the displays and LEDs on the Enterprise Virtual Array. (Refer to *HP StorageWorks Enterprise Virtual Array User Guide* or the *HP StorageWorks Enterprise Virtual Array 3000 User Guide* for information and illustrations related to displays and LEDs.)

Note: If you are performing the upgrade process remotely, you do not have to do this step. However, it is very important that you check the state of your hardware elements. You can do this remotely through Command View EVA. See step 2 for more information.

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   a. Verify that the Operator Control Panels (OCPs) on the HSV controllers are properly displaying the WWNs and storage system names.
   b. Verify that there are no fault LEDs on the drive enclosures.
   c. Verify that the Power LEDs are on, and the Activity LEDs are flashing on the disk drives.
   d. Verify that there are no errors on the Environmental Monitoring Unit (EMU) displays.
   e. Verify that each I/O module is displaying two green LEDs (viewed from rear).

Note: If your Enterprise Virtual Array does not use FC loop switches, verify that there are three green LEDs.

---

   f. Verify that the power supplies and blowers are operating correctly.
   g. Check the back of each HSV controller. Verify that all of the LEDs are green and not blinking.

2. Launch Command View EVA and click the icon of the storage system you want to upgrade. Check for hardware errors.
   a. Look at the Hardware folder in the Navigation pane. If there are any hardware caution or warning conditions, Command View EVA displays the appropriate icon over the folder.

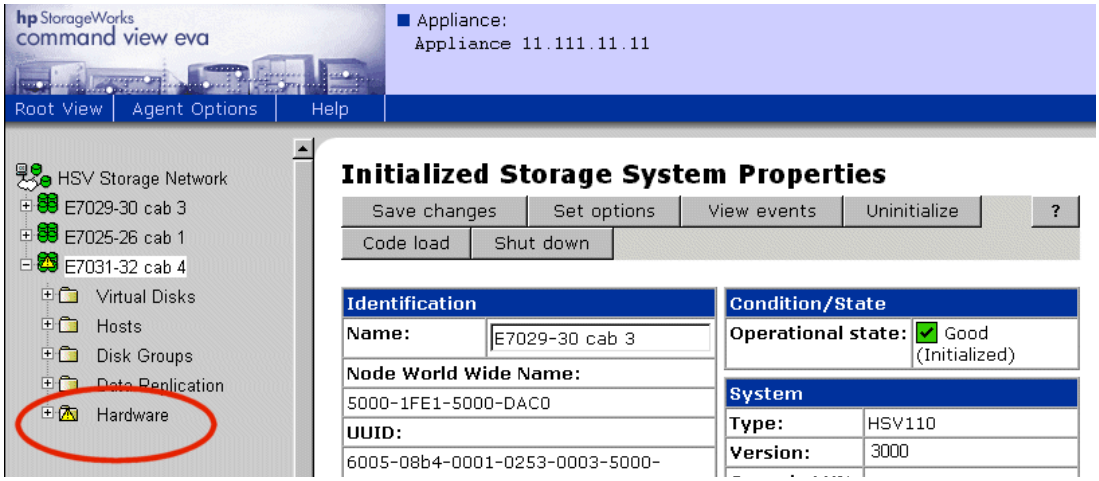

Figure 1: Command View EVA—Hardware folder in the Navigation pane

   b. Click the Hardware folder to expand the navigation tree.

      The Hardware Folder Properties page displays. The **Operational State** field also indicates if there is a hardware problem.

Figure 2: Command View EVA—Hardware Folder Properties page

   c. Continue to expand the navigation tree under the Hardware folder, until you see a hardware component icon with an attention or warning icon on it.

d. Click the component icon to display the properties page. The **Operational state** field indicates if there is a hardware error.

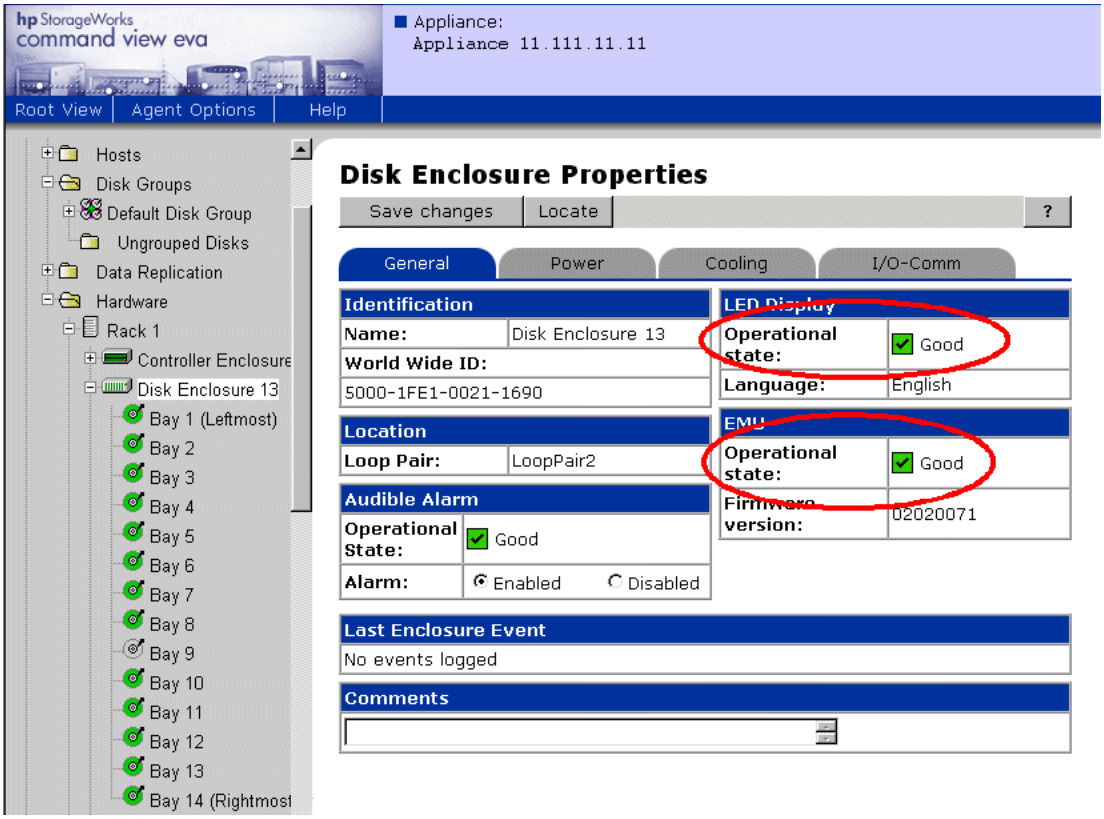

Figure 3: Command View EVA—Disk Enclosure Properties page—checking operational states

3. Record the Environmental Monitoring Unit (EMU) firmware version.
   a. Click the storage system icon in the Navigation pane.

      The Initialized Storage System page displays.
   b. Click the Hardware folder in the Navigation pane.

      The Hardware Folder Properties page displays.
   c. Expand the navigation tree under the Rack icon.
   d. Click the Disk Enclosure icon in the Navigation pane.

The Disk Enclosure Properties page displays.

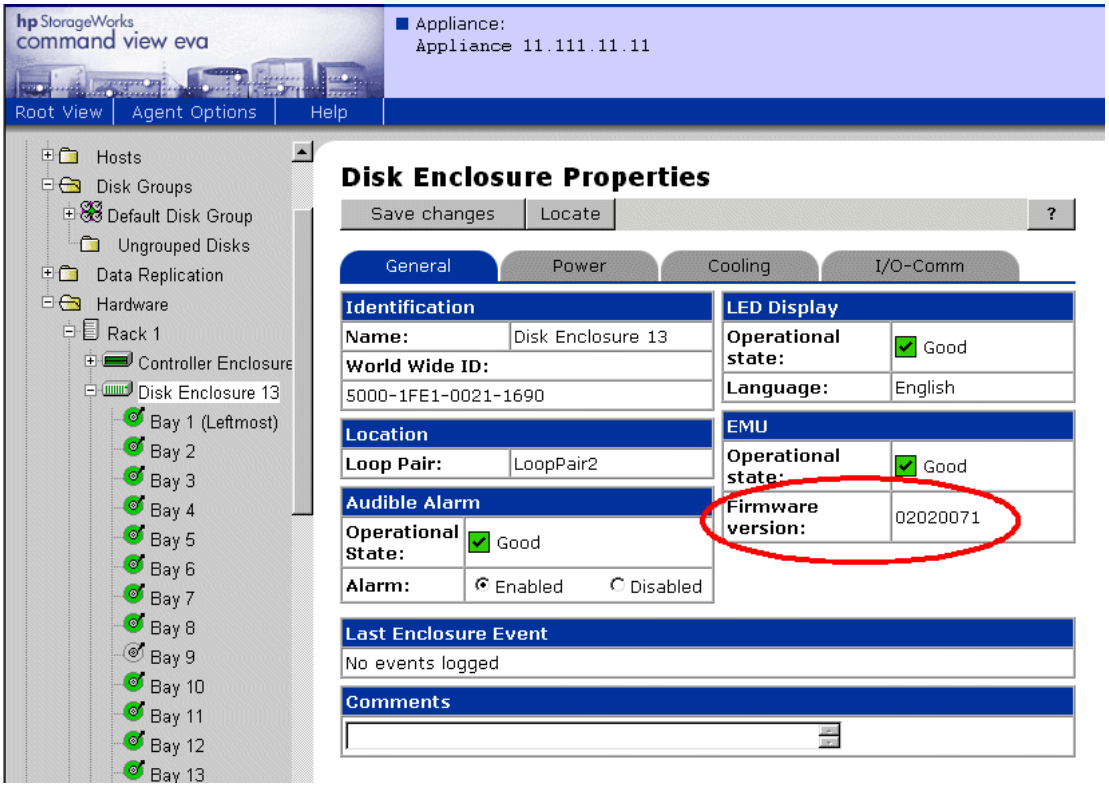

Figure 4: Command View EVA—Disk Enclosure Properties page—checking the firmware version

e. In the EMU group, record the number listed in the **Firmware version** field.

f. Repeat step d and step e for each disk enclosure in the rack. If there is more than one rack in the storage system, record the firmware version for each disk enclosure in the storage system.

4. Verify that there are no hardware components in the Unmappable Hardware folder.

   a. Expand the navigation tree under the Hardware folder in the Navigation pane.

   b. Click the Unmappable Hardware folder.

      Hardware components can be placed in the Unmappable Hardware folder for several reasons. For example, hardware components can be placed in the Unmappable Hardware folder, when the I/O modules on a disk enclosure are not working, the controllers restart, or there is a hardware failure. If there are any hardware components listed under this folder, determine why they are listed there and fix the problems.

5. Using Command View EVA, examine the controller event log. Verify that no Critical events occurred in the last 48 hours.

   a. Click a storage system icon in the Navigation pane.

   b. Click **View Events**.

The View Events page displays.

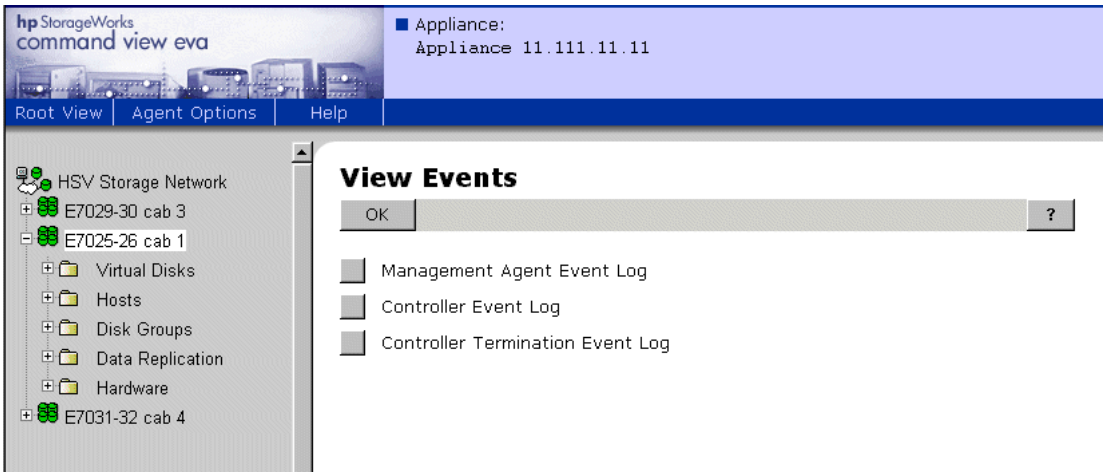

Figure 5: Command View EVA—View Events page

c. Click **Controller Event Log**.

The Controller Events page displays in a new browser window.

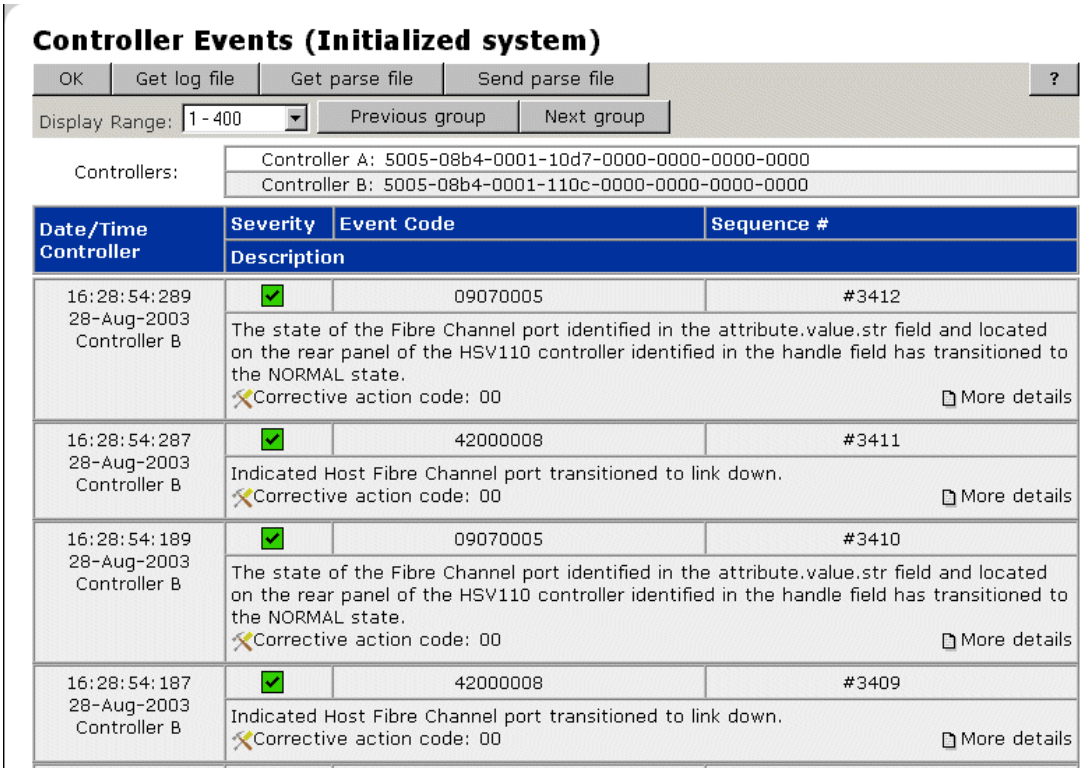

Figure 6: Command View EVA—Controller Events (Initialized system) page

d. Verify that no unexpected Critical events have occurred in the past 48 hours.

e. If Critical events have occurred in the past 48 hours, perform the steps outlined in the corrective action codes to correct the problems. In some cases, it might be necessary to call your HP authorized representative to fix the problem.

6. Verify that the hosts can see the Vdisks.

7. Verify that each disk group contains a minimum of eight disk drives.
   a. In Command View EVA, click the Disk Group folder in the Navigation pane.

      The Disk Group Folder Properties page displays.
   b. Click a disk group icon.

      The Disk Group Properties page displays.
   c. Check the **Total disks** field in the Disk Group Properties page.

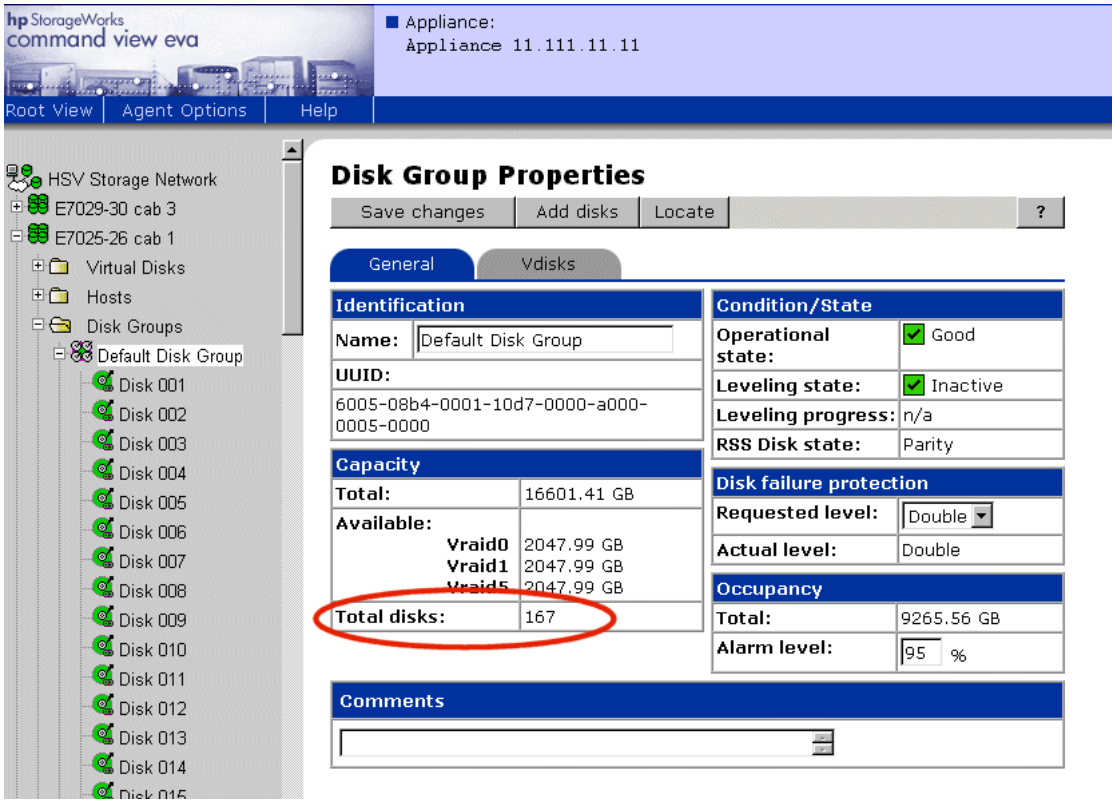

Figure 7: Command View EVA—Disk Group Properties page

   d. If each disk group does not contain a minimum of eight disk drives, correct your disk group configuration.
8. Verify that there is at least 5% free space in all disk groups.
   a. In Command View EVA, click the Disk Group folder in the Navigation pane.

      The Disk Group Folder Properties page displays.
   b. Click a disk group icon in the Navigation pane.

      The Disk Group Properties page displays.

c. Compare the **Capacity** to the **Occupancy** data in the Disk Group Properties page to determine how much free space there is in the disk group.

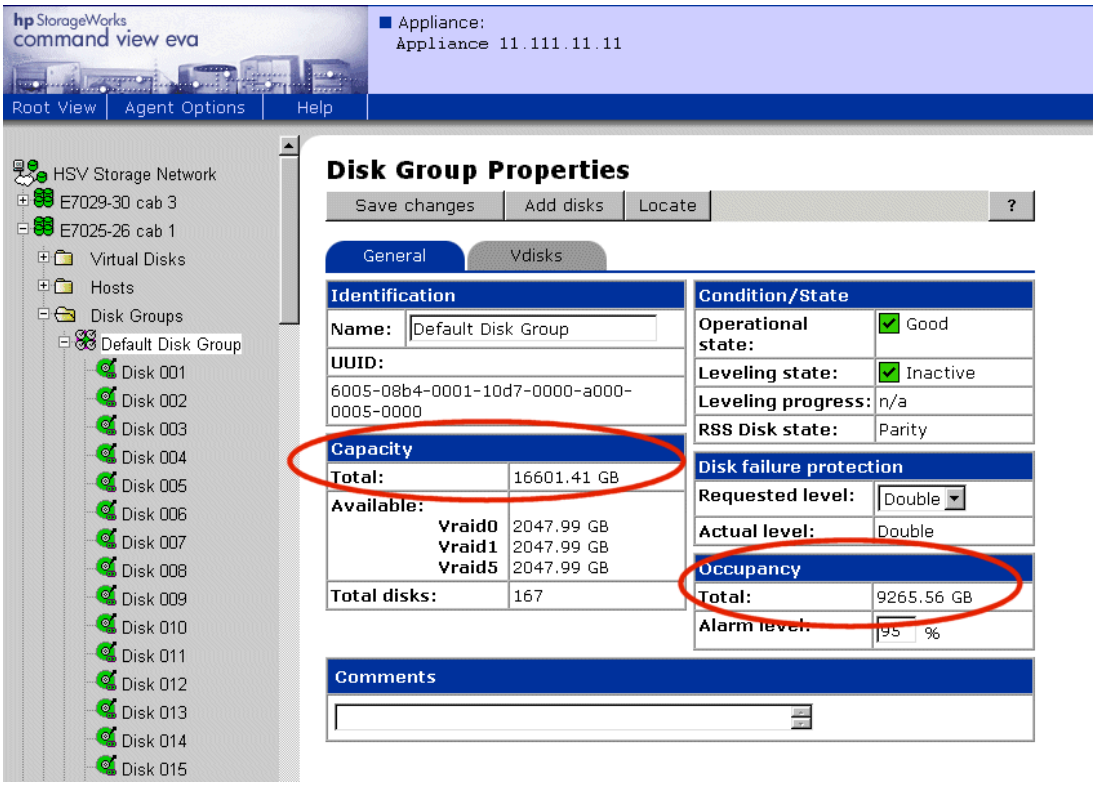

Figure 8: Command View EVA—Disk Group Properties page—checking free capacity

9. Check the Vraid levels for each Vdisk.
   a. In Command View EVA, click the Virtual Disks folder in the Navigation pane.

      The Vdisk Folder Properties page displays.

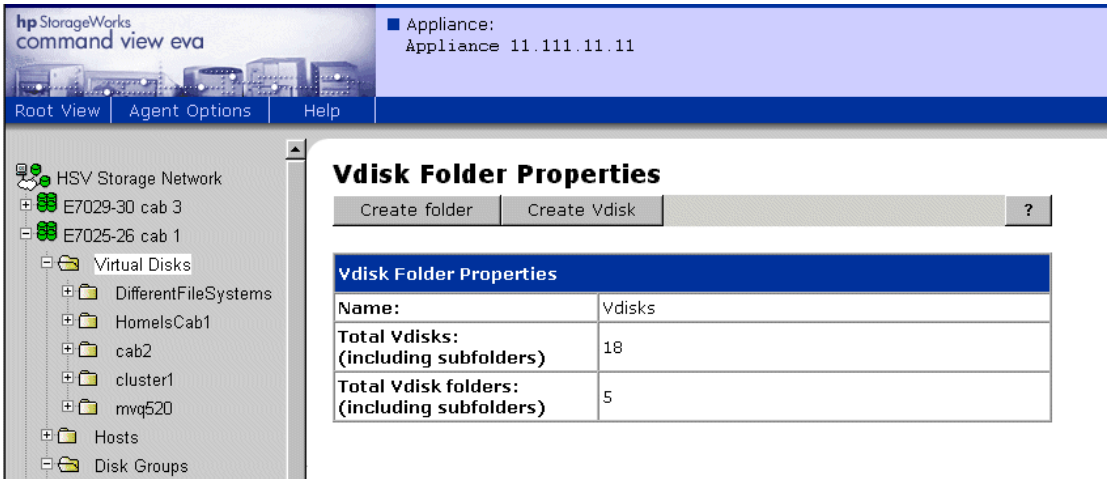

Figure 9: Command View EVA—Vdisk Folder Properties page

Note: If you are using virtual disk subfolders, expand the subfolders to view the Vdisk family icons.

b. Click a Vdisk family icon.

The Vdisk Family Properties page displays.

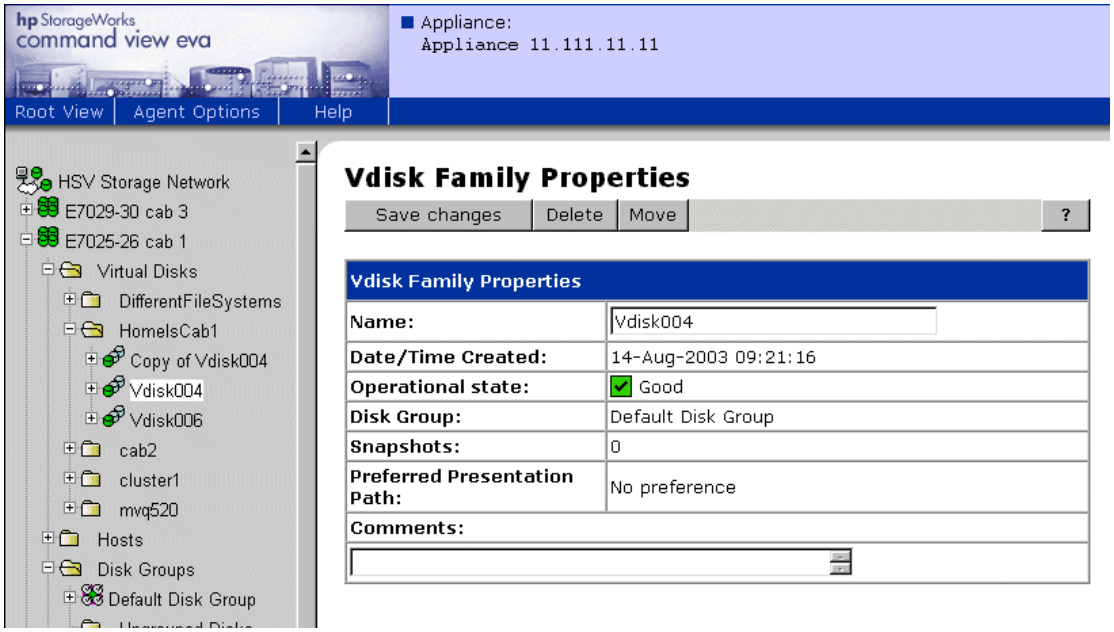

Figure 10: Command View EVA—Vdisk Family Properties page

c. Click the ACTIVE icon.

The Vdisk Active Member Properties page displays.

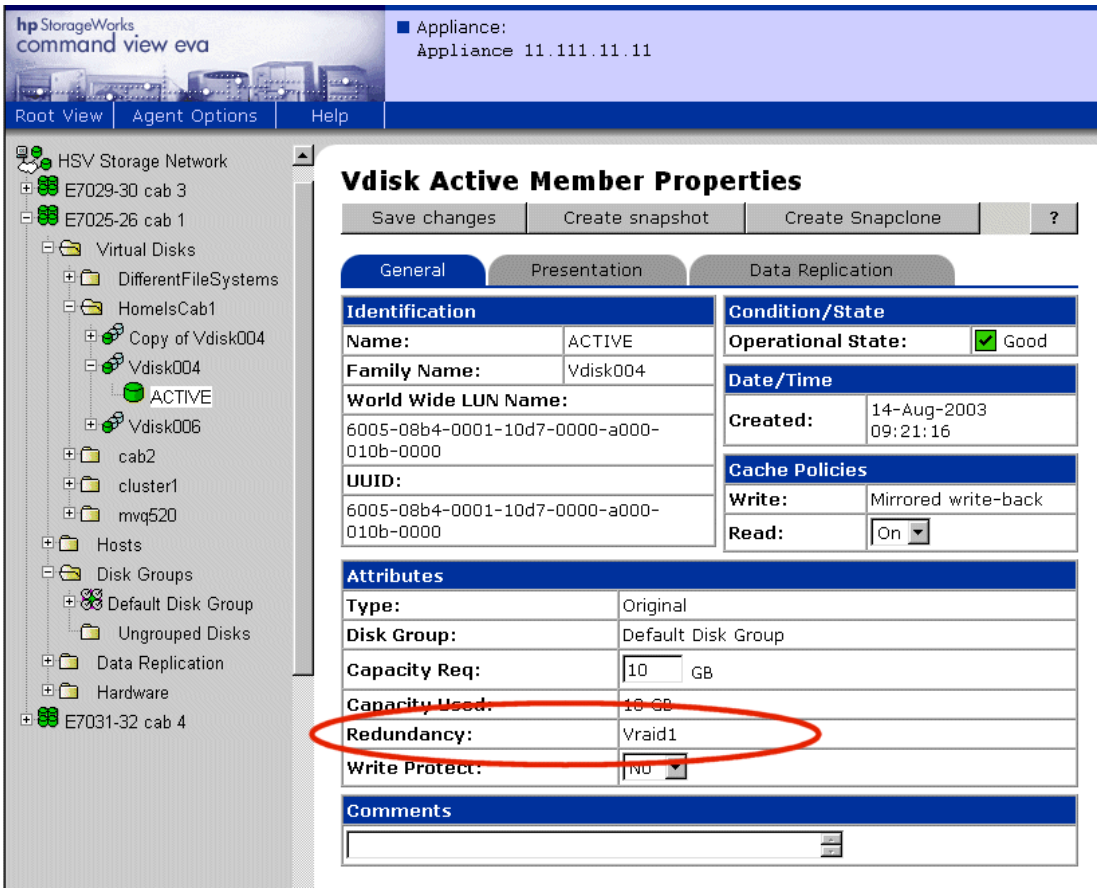

Figure 11: Command View EVA—Vdisk Active Member Properties page

d. Check the **Redundancy** field.

   If any Vdisks use Vraid0 protection, you might want to consider changing your Vdisk configuration. Vraid0 provides no data protection.

10. Verify that there are no configuration changes in progress. For instance, Command View EVA should not be in the process of creating a Vdisk.

    If there are configuration changes in progress, wait 48 hours after configuration changes have been made before upgrading. Check the controller event log for unwanted events.

11. Back up the data in the Enterprise Virtual Array.

Caution: Always back up your data before performing major operations such as software upgrades.

Step 2: Redeeming License Keys

Estimated Time to Complete

1 to 48 hours

Verify that you have the appropriate add-on licenses. See "Required Licenses" on page 18 for more information.

Step 3: Upgrading the Storage Management Appliance

This section contains the following procedures:

- Upgrading the Storage Management Appliance Software from v2.0 to v2.1, page 39
- Verifying the Storage Management Appliance Software Version, page 43

Estimated Time to Complete

1.5 to 2.5 hours

You must upgrade the Storage Management Appliance software to v2.1. Please use the Storage Management Appliance software v2.1 CD, and refer to the instructions in the *HP OpenView Storage Management Appliance Software Update Installation Card*.

If your Storage Management Appliance is running Storage Management Appliance software v1.0C or later, you can upgrade to Storage Management Appliance software v2.1. You do not have to install any of the v2.0 service packs. Version 2.1 of the Storage Management Appliance software includes all of the necessary components. Table 9 describes the proper upgrade paths to Storage Management Appliance software v2.1.

Table 9: Storage Management Appliance Software Upgrade Paths

Current Storage Management Appliance Software Version	Upgrade Path
Storage Management Appliance software v1.0C	Upgrade directly to Storage Management Appliance software v2.1
Storage Management Appliance software v2.0	
Storage Management Appliance software v2.0, Service Pack1a	
Storage Management Appliance software v2.0, Service Pack 3	
Storage Management Appliance software v2.0, Service Pack 4	

Changes To Default Maximum Log Size

The default maximum log file size for the Storage Management Appliance software v2.1 is 16 MB for the Event log and 8 MB for the Audit log. Previously in v2.0, the maximum log file size was 512 MB for both logs.

Caution: If you have Audit or Event log files that are larger than the new maximum sizes, and you want to retain them, back up the logs before you upgrade the Storage Management Appliance software from v2.0 to v2.1. The Storage Management Appliance software will delete the log files if they exceed the default maximum sizes.

Upgrading the Storage Management Appliance Software from v2.0 to v2.1

If you are running Storage Management Appliance software v1.0C, please refer to the instructions in the *HP OpenView Storage Management Appliance Software Update Installation Card*. If you are running Storage Management Appliance software v2.0 (or later), perform the following steps to upgrade to v2.1:

Caution: You cannot update the Storage Management Appliance software using a Terminal Services session. You must log in to the Storage Management Appliance software using a remote browser.

1. From a client computer, launch a Web browser and browse to the Storage Management Appliance, using the following format:

   `http://<appliance_name>/`

Note: The default appliance name for a Storage Management Appliance (hardware version 1.0) begins with *swma* and includes the last 6 characters of the appliance serial number.

If the Storage Management Appliance software was restored using the Quick Restore CD v2.0, then the default appliance name begins with *sma* and includes all 12 characters of the appliance serial number.

The default appliance name for a Storage Management Appliance II begins with *sma* and includes all 12 characters of the appliance serial number.

2. Log in to the Storage Management Appliance software using a valid username and password.

Note: You must have administrator privileges.

3. Insert the Storage Management Appliance software v2.1 Update CD-ROM in to the CD-ROM drive of the Storage Management Appliance.
4. Click **Settings** in the tool bar.

The Settings page displays.

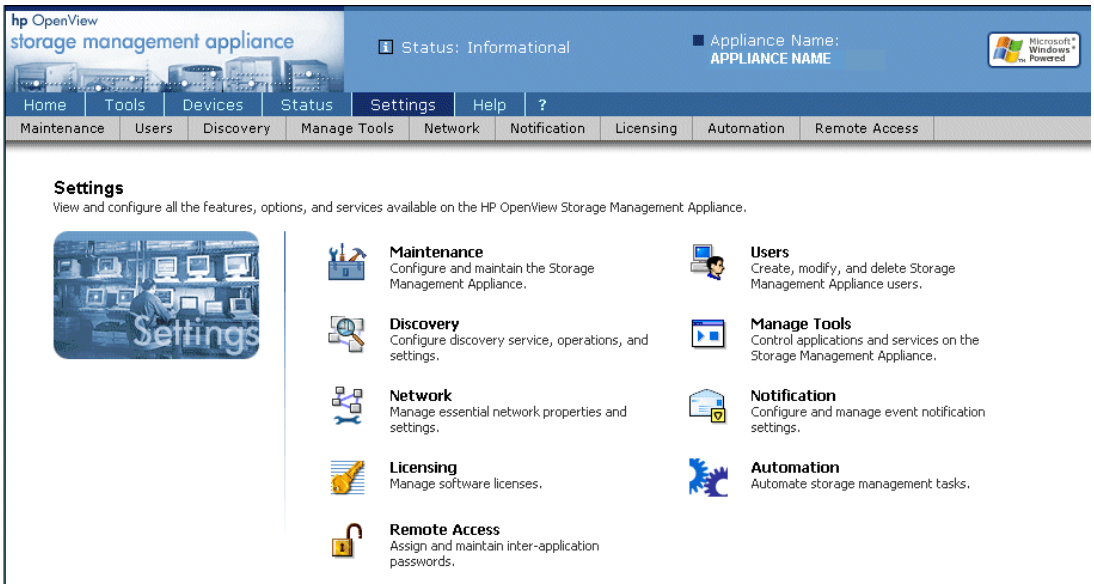

Figure 12: Storage Management Appliance software—Settings page

5. Click **Maintenance** in the tool bar.

   The Maintenance page displays.

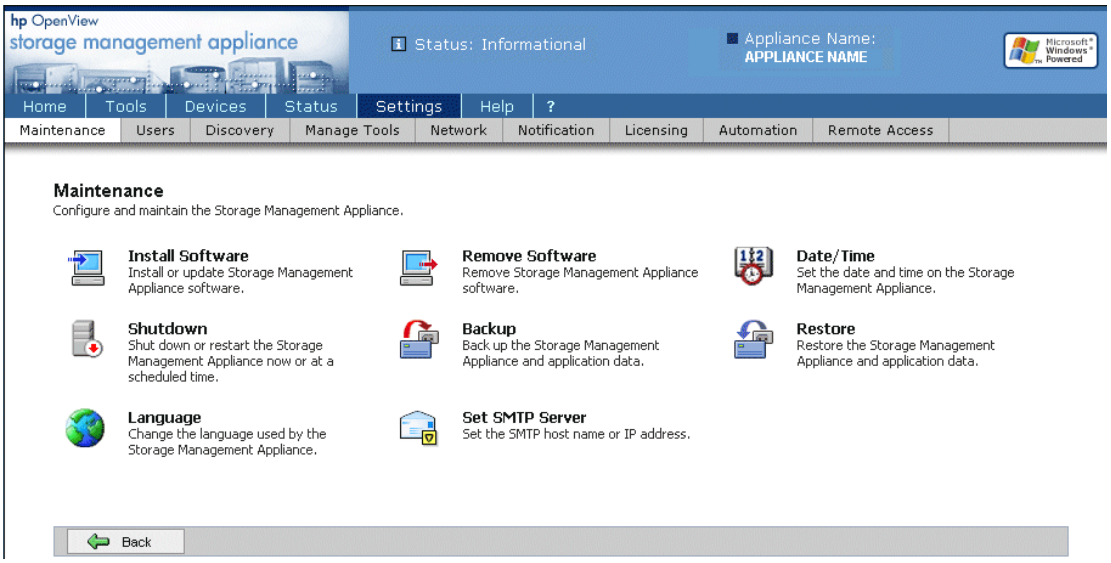

Figure 13: Storage Management Appliance software—Maintenance page

6. Click **Install Software**.

   An Installation Wizard page displays.

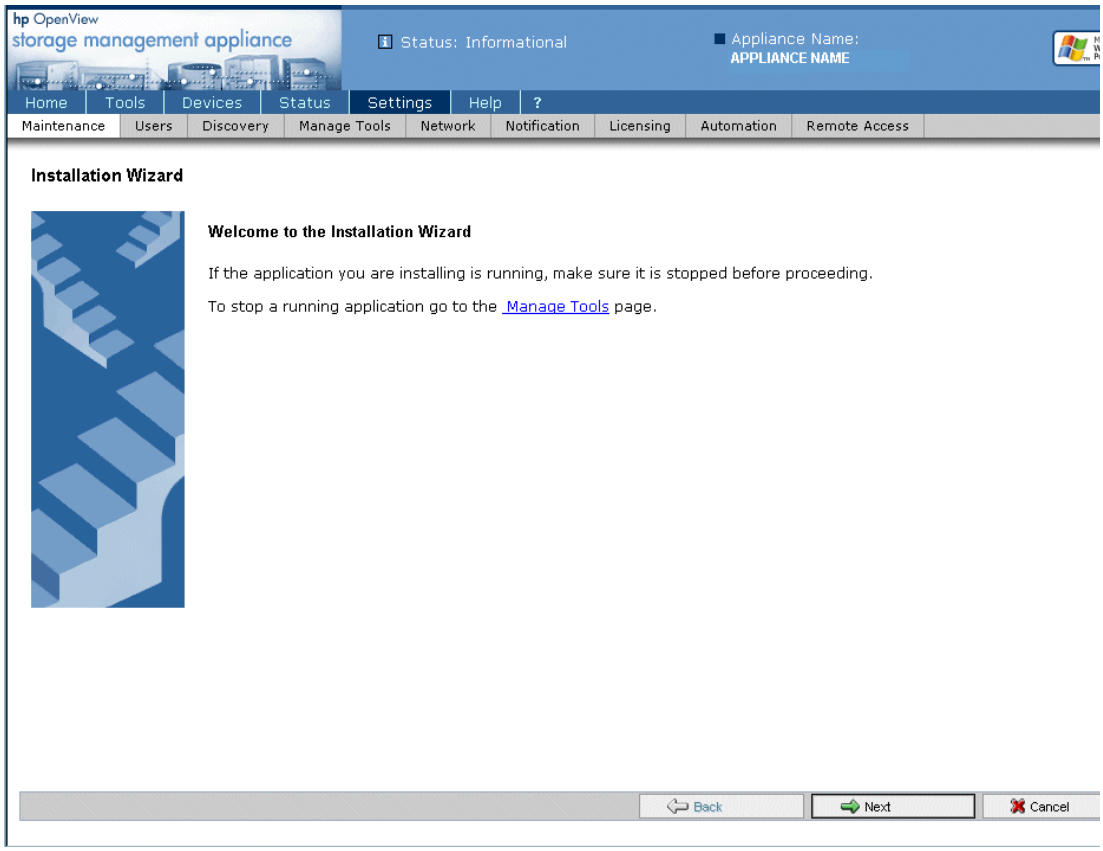

Figure 14: Storage Management Appliance software—Installation Wizard

7. Click **Next** at the bottom of the page.

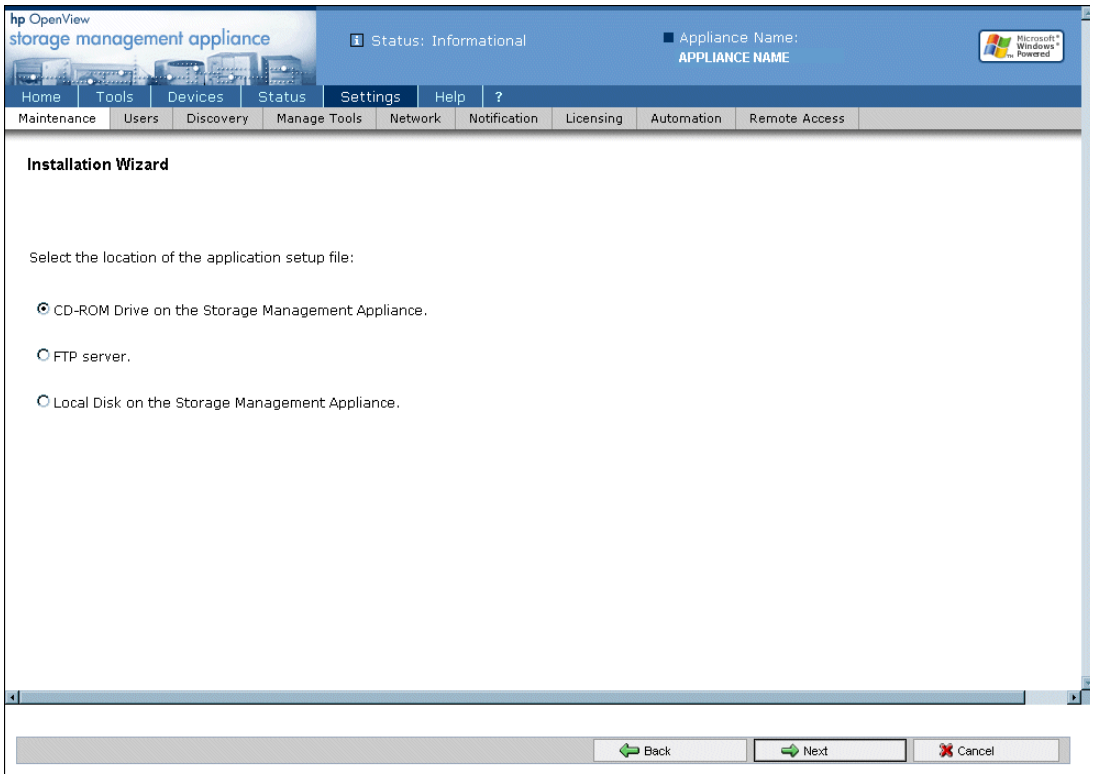

Figure 15: Storage Management Appliance software—Installation Wizard—installation types

8. Choose **CD-ROM Drive on the Storage Management Appliance**.

Note: The **FTP Server** and **Local Disk on the Storage Management Appliance** options cannot be used for upgrading from v2.0 to v2.1.

---

9. Click **Next** at the bottom of the page.
10. Verify that the appliance name and IP address are correct.
11. Click **Next** at the bottom of the page.
12. Select **Storage Management Appliance v2.1** from the drop-down list.
13. Click **Next** at the bottom of the page.

    The installation process begins. A status bar displays.

Note: The installation process can last one hour. Wait until the installation completes before you perform any other actions in the Storage Management Appliance software.

When the installation finishes, the Storage Management Appliance reboots and the Storage Management Appliance software v2.1 starts up automatically.

Verifying the Storage Management Appliance Software Version

1. From a client computer, launch a Web browser and browse to the Storage Management Appliance, using the following format:

   `http://<appliance_name>/`

Note: The default appliance name for a Storage Management Appliance (hardware version 1.0) begins with *swma* and includes the last 6 characters of the appliance serial number.

If the Storage Management Appliance software was restored using the Quick Restore CD v2.0, then the default appliance name begins with *sma* and includes all 12 characters of the appliance serial number.

The default appliance name for a Storage Management Appliance II begins with *sma* and includes all 12 characters of the appliance serial number.

The serial number is displayed on a sticker which is usually pasted to the lower right side of the appliance (when viewed from the front).

---

2. Log in to the Storage Management Appliance software using a valid username and password.

Note: You must have administrator privileges.

---

3. Click **Help** in the tool bar.

   The welcome page of online help for the Storage Management Appliance software displays the current version of the software.

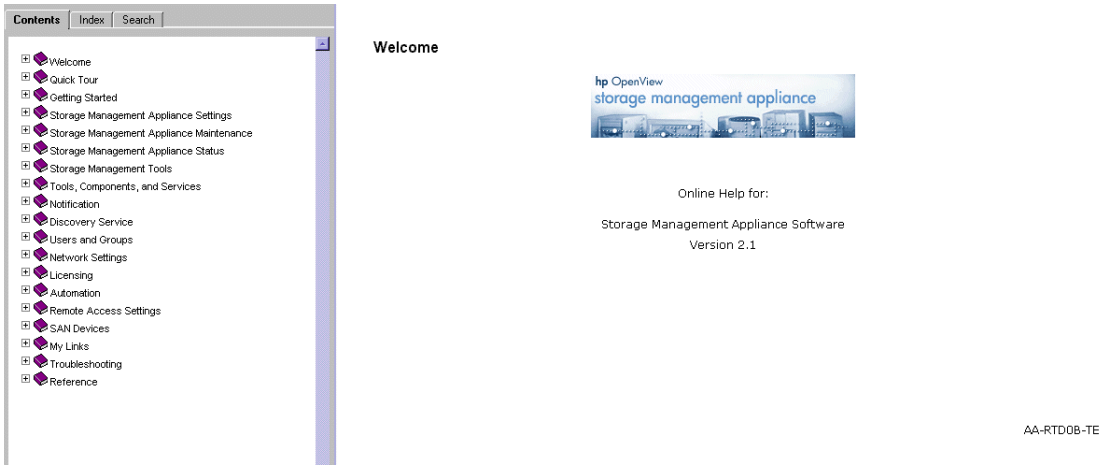

Figure 16: Storage Management Appliance Online Help

Step 4: Upgrading Host Servers

Estimated Time to Complete

varies by host type (see Table 10)

After you have upgraded the Storage Management Appliance software, you can upgrade the platform kits on your host servers.

Please refer to the platform-specific installation documentation for detailed upgrade instructions. See Table 4 on page 19 for a list of host server documentation.

The Windows, Novell Netware, Linux, Sun Solaris, and IBM AIX host server kits contain FCA drivers, enabling scripts, utilities, Storage System Scripting Utility (SSSU), and documentation.

In the HP-UX, Tru64, and OpenVMS host server kits, the FCA drivers are embedded in the operating system. Therefore, the kits contain enabling scripts, utilities, SSSU, and documentation.

Table 10: Time Estimates for Host Server Upgrades

Host OS	Estimated Time for Upgrade
Windows	1 to 3 hours
Novell Netware	1 to 3 hours
Sun Solaris	15 minutes
IBM AIX	15 minutes
Tru64	30 minutes
OpenVMS	30 minutes
HP-UX	15 minutes

Step 5: Clearing the Passwords on the HSV Controllers

Estimated Time to Complete

15 minutes

If you are using passwords on your HSV controllers, you must clear the passwords, before you upgrade Command View EVA. You can add passwords to your storage system after you complete the Command View EVA upgrade (see "Step 9: Adding Passwords to the HSV Controllers (optional)" on page 74). Use the following procedure to clear the storage system passwords on the HSV controllers.

Note: When you clear a system password on the controller, you must disable password access from any Command View EVA with access to this storage system.

Using the Operator Control Panel (OCP) on the HSV Controller:

1. Press ▶ to leave the default display.
2. Press ▼ four times to scroll to System Password.
3. Press ▶ to select System Password.
4. Press ▼ to display Clear Password.
5. Press ▶ to select Clear Password.

   The OCP displays Clear Password No?
6. Press ▼.

   The OCP displays CLEAR PASSWORD Yes?
7. Press ◀ to clear the password.

   The password is cleared. The system automatically returns to the default display (WWID).
8. Disable password access to this storage system in Command View EVA.

Disabling Password Access in Command View EVA

Estimated Time to Complete

10 minutes

To disable password access to a storage system in Command View EVA, perform the following steps:

1. Launch Command View EVA in your browser.
2. Click **Agent Options** in the Session pane.

The Management Agent Options page displays.

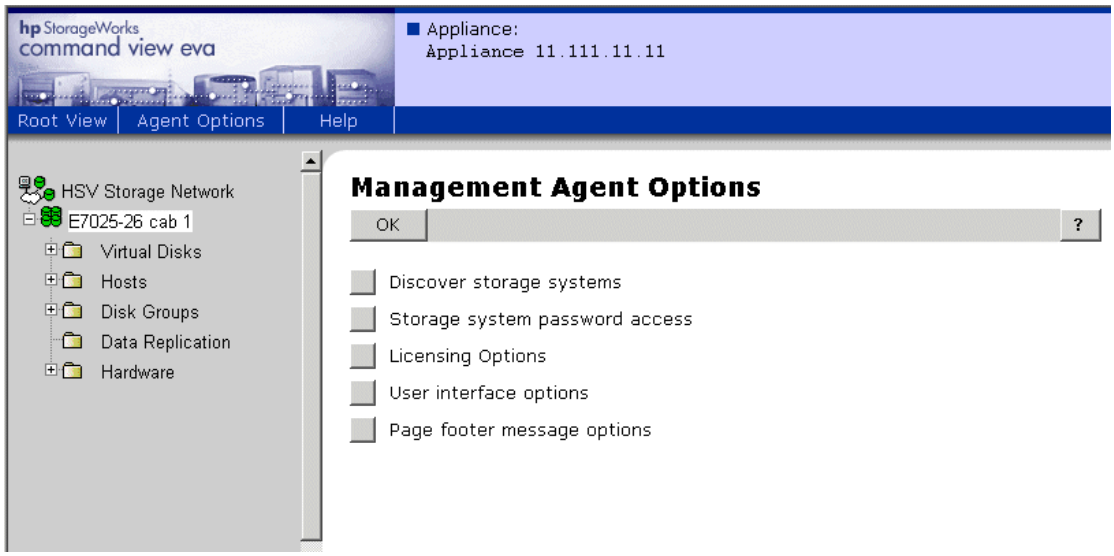

Figure 17: Command View EVA—Management Agent Options page

3. Click **Storage system password access**.

   The Storage System Password Access page displays.

Figure 18: Command View EVA—Storage System Password Access page

4. Click **Disable**.

The Disable Password Access to Storage System page displays.

Figure 19: Command View EVA—Disable Password Access to Storage System page

5. Select the storage system World Wide Node Name from the drop-down list.

Note: Make sure you select the storage system from which you cleared passwords using the OCP on the HSV controller.

---

6. Click **Disable Password**.

   A message box displays.

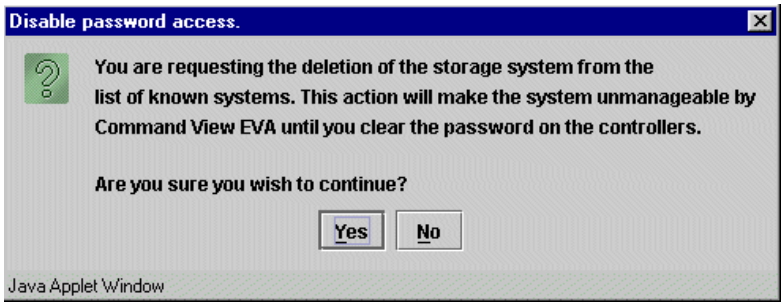

Figure 20: Command View EVA—Disable password access message box

7. Click **Yes** to disable the password for the selected storage system.

Step 6: Upgrading Command View EVA

This section contains the following procedures:

- Upgrading to Command View EVA v3.1, page 48
- Verifying the Command View EVA Version, page 62

Estimated Time to Complete

45 minutes

You must upgrade to Storage Management Appliance software v2.1, before you upgrade to Command View EVA v3.1. (See "Step 3: Upgrading the Storage Management Appliance" on page 38 for more information.)

You must be running HSV Element Manager v2.0 or later to upgrade to Command View EVA v3.1. You cannot upgrade from HSV Element Manager v1.0 to Command View EVA v3.1. To upgrade from HSV Element Manager v1.0 to HSV Element Manager v2.0, please refer to *SANworks by Compaq Upgrade Instructions for Enterprise Virtual Array*. Table 11 describes the proper upgrade paths to Command View EVA v3.1.

Table 11: Command View EVA Upgrade Paths

Current Command View EVA Version	Upgrade Path
HSV Element Manager v2.0	Upgrade to Command View EVA v3.1.
HSV Element Manager v2.0a	
Command View EVA v2.1	
Command View EVA v3.0	
Command View EVA v3.0a	

The installation of Storage Management Appliance software v2.1 automatically installed Command View EVA v3.0a over your previous element manager version.

To verify which version of Command View EVA you are using, see "Verifying the Command View EVA Version" on page 62 for assistance.

Upgrading to Command View EVA v3.1

Note: Remember to remove the passwords from the HSV controllers and Command View EVA (or HSV Element Manager) before you upgrade to Command View EVA v3.1. (See "Step 4: Upgrading Host Servers" on page 44.)

To upgrade to Command View EVA v3.1, perform the following steps:

1. Close all browser windows, Microsoft® Management Console (MMC) sessions, Terminal Services sessions, and Java applets that are open to and on the Storage Management Appliance.
2. From a client computer, launch a Web browser and browse to the Storage Management Appliance, using the following format:

   `http://<appliance_name>/`

Note: The default appliance name for a Storage Management Appliance (hardware version 1.0) begins with *swma* and includes the last 6 characters of the appliance serial number.

If the Storage Management Appliance software was restored using the Quick Restore CD v2.0, then the default appliance name begins with *sma* and includes all 12 characters of the appliance serial number.

The default appliance name for a Storage Management Appliance II begins with *sma* and includes all 12 characters of the appliance serial number.

3. Log in to the Storage Management Appliance software using a valid username and password.

Note: You must have administrator privileges.

The Home page displays.

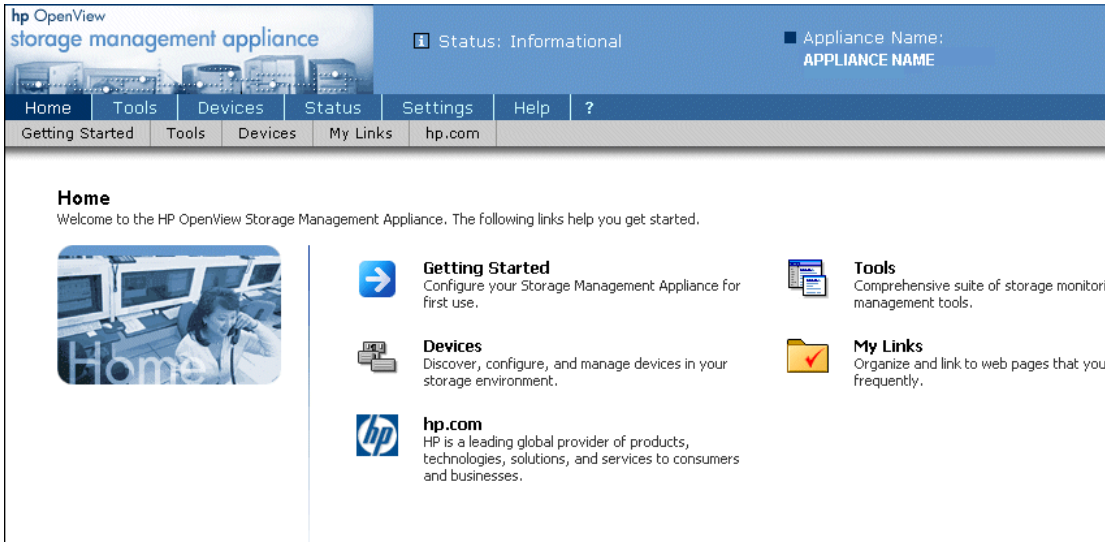

Figure 21: Storage Management Appliance software—Home page

4. Click **Settings** in the tool bar.

   The Settings page displays.

Figure 22: Storage Management Appliance software—Settings page

5. Click **Manage Tools**.

   The Manage Tools page displays.

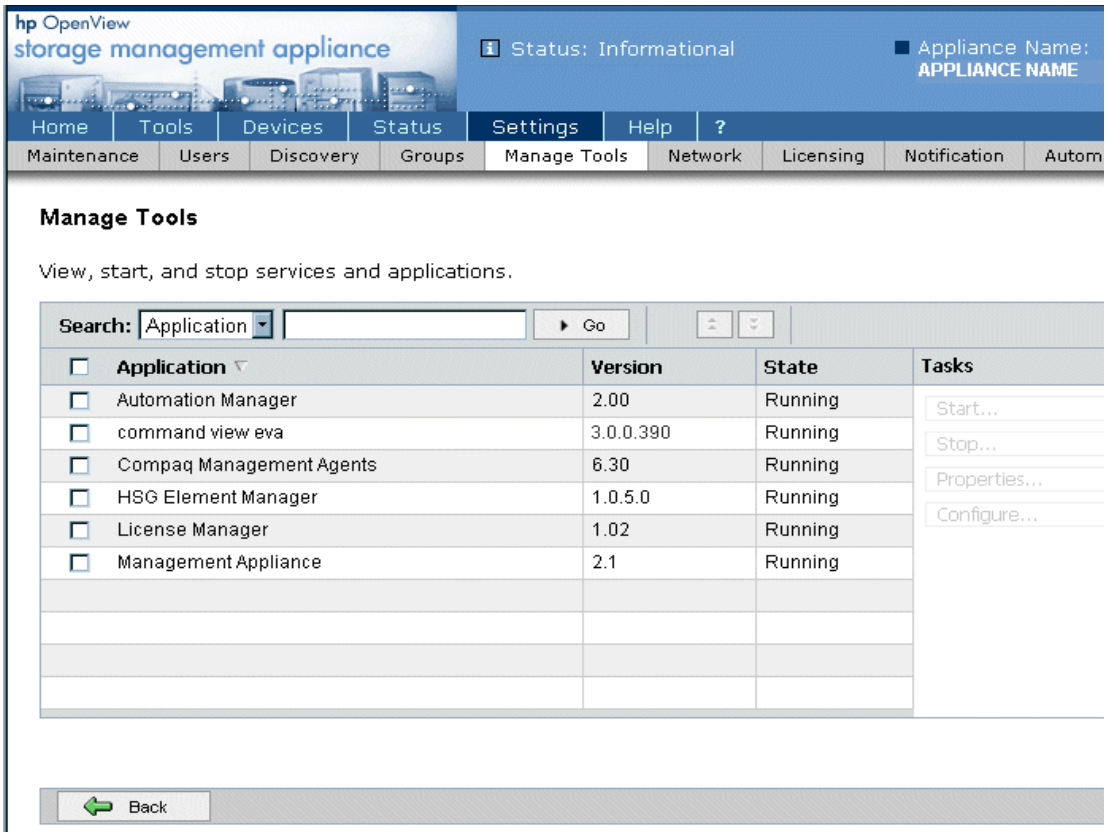

Figure 23: Storage Management Appliance software—Manage Tools page

6. Select the **command view eva** checkbox.

Note: The screen content varies depending on the current element manager version you are using. If you are using Command View EVA 2.1 or lower, the screen displays *HSV Element Manager*. If you are using Command View EVA v3.0 or higher, the screen displays *command view eva*. Depending on your current product version, please select the appropriate element manager.

7. Click **Stop** in the **Tasks** column.

   The Stop Applications wizard displays.

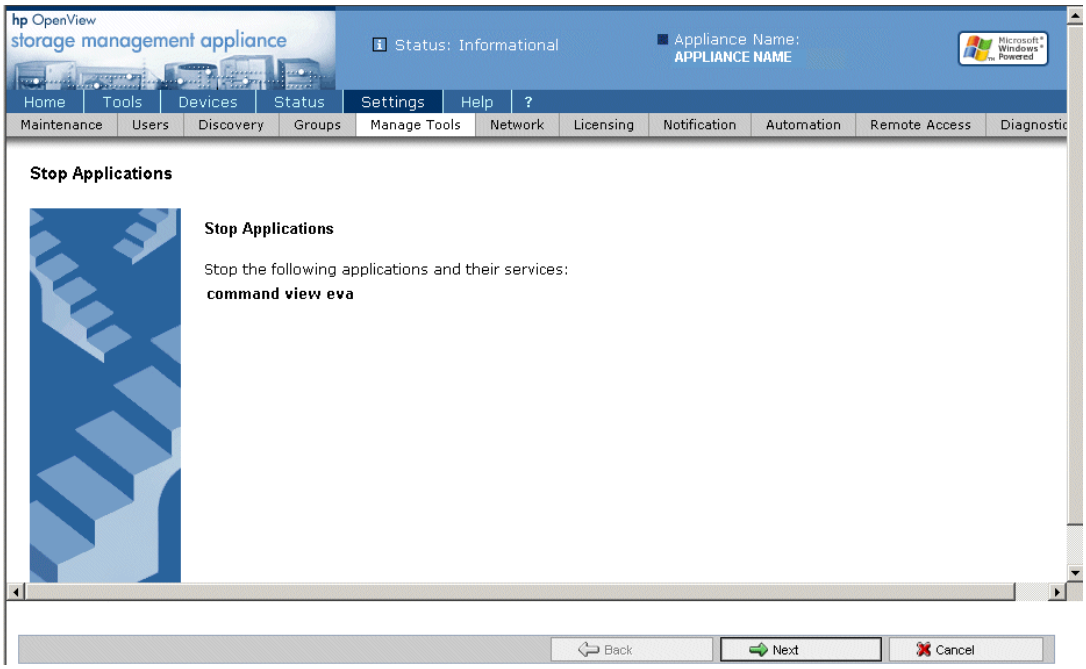

Figure 24: Storage Management Appliance software—Stop Applications wizard

8. Click **Next**.

   A message displays when the appliance has successfully stopped the application.

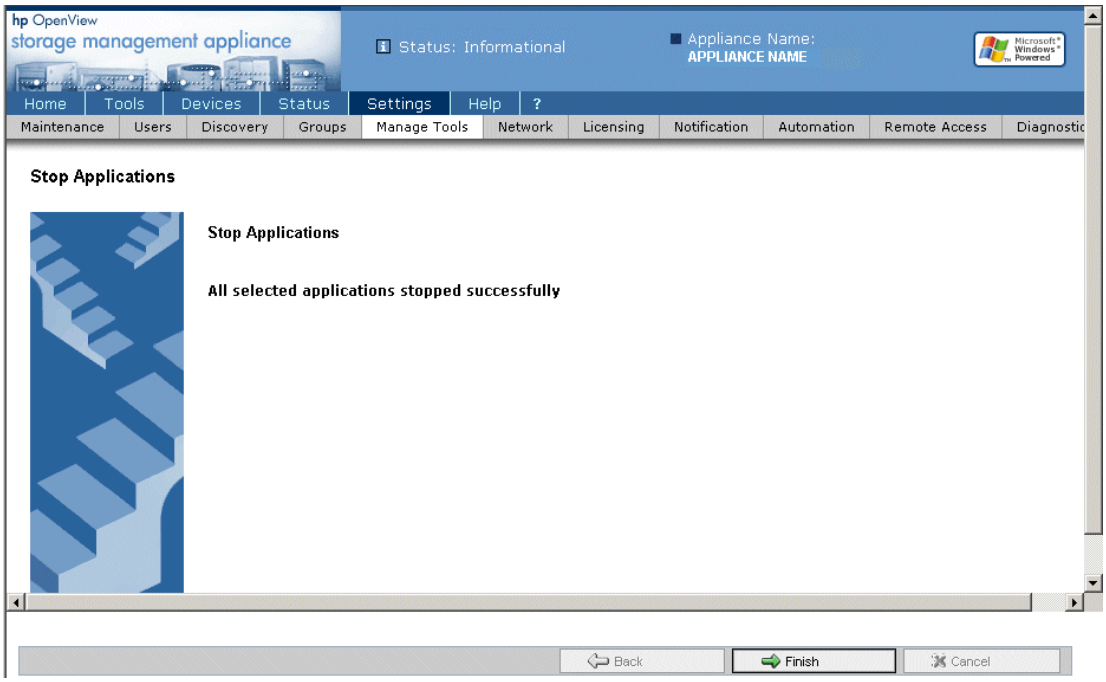

Figure 25: Storage Management Appliance software—Stop Applications Wizard—Successful Message

9. Click **Finish**.

   The Manage Tools page displays.

10. Verify that the state of the command view eva application is stopped.
11. Repeat step 5 through step 10 to stop the following applications, if they are installed: Continuous Access EVA user interface, Storage Provisioner, and Business Copy EVA.
12. Click **Maintenance** in the tool bar.

    The Maintenance page displays.

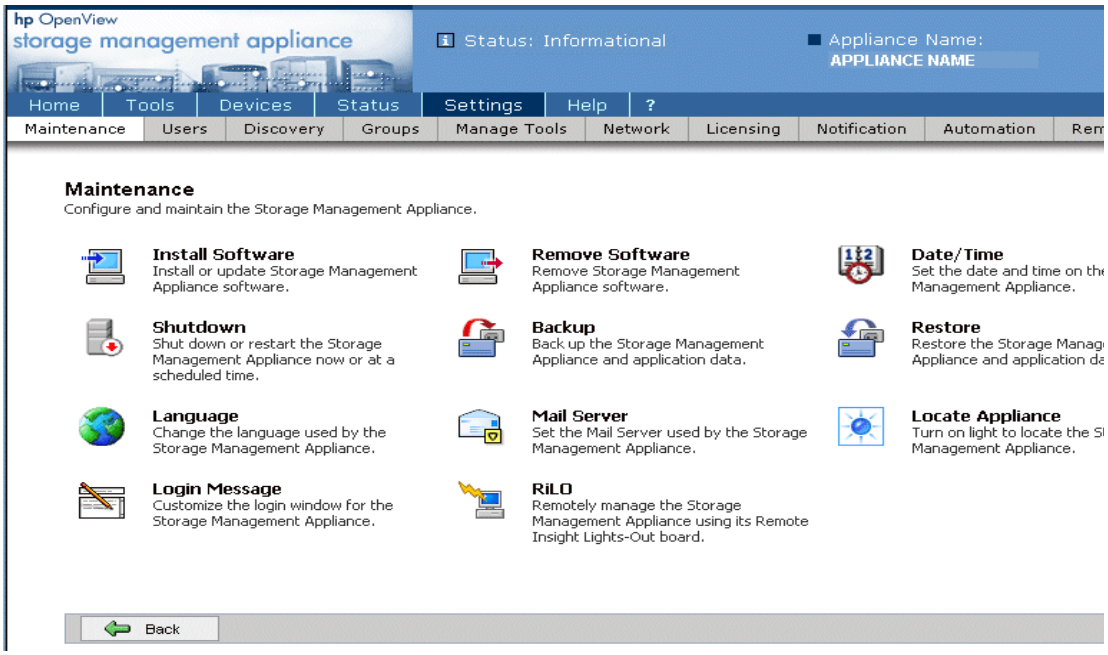

Figure 26: Storage Management Appliance software—Maintenance page

13. Determine the installation method to use from the following list and continue in the appropriate section of this procedure:
    - CD-ROM Drive on the Storage Management Appliance Installation (Perform the steps in "Installing Command View EVA from the CD-ROM Drive on the Storage Management Appliance" on page 53.)
    - FTP Server Installation (Perform the steps in "Installing Command View EVA from an FTP Server" on page 57.)

      Use this option only if the SWP file has been saved to an FTP server.
    - Local Disk on the Storage Management Appliance Installation (Perform the steps in "Installing Command View EVA from a Local Disk on the Storage Management Appliance" on page 59.)

      Use this option to install an SWP file from the Storage Management Appliance hard disk installation kits directory.

Installing Command View EVA from the CD-ROM Drive on the Storage Management Appliance

To install Command View EVA from the CD-ROM Drive, perform the following steps:

1. Insert the Command View EVA v3.1 CD-ROM into the CD-ROM drive on the Storage Management Appliance.
2. Click **Install Software**.

   An Installation Wizard page displays.

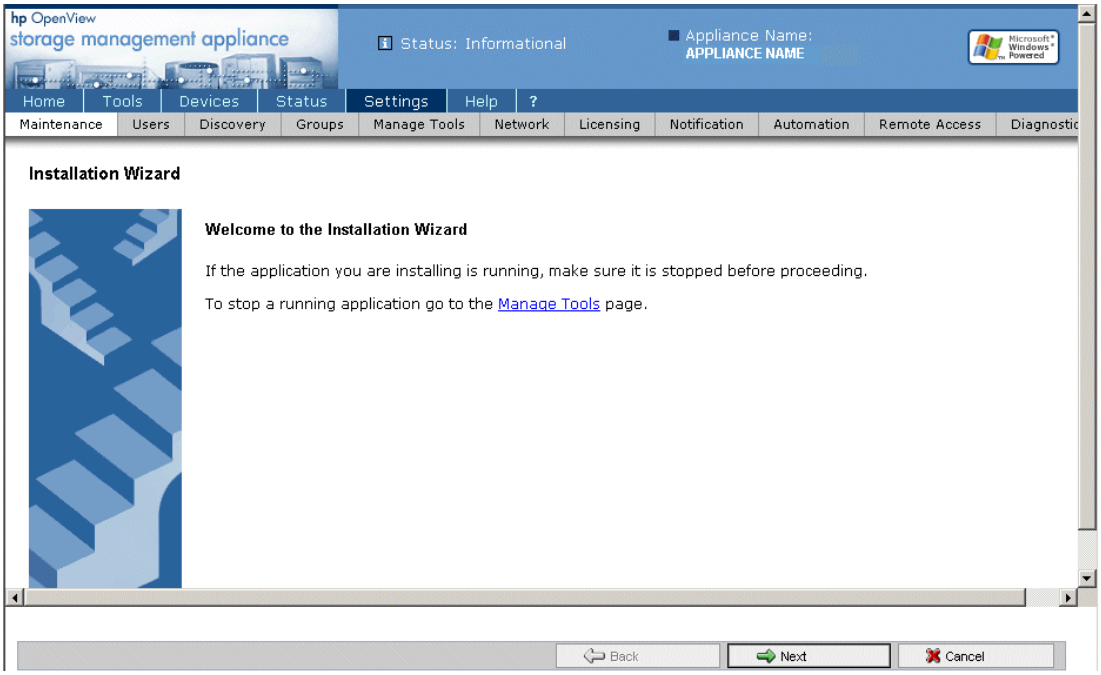

Figure 27: Storage Management Appliance software—Installation Wizard

3. Click **Next** at the bottom of the page.

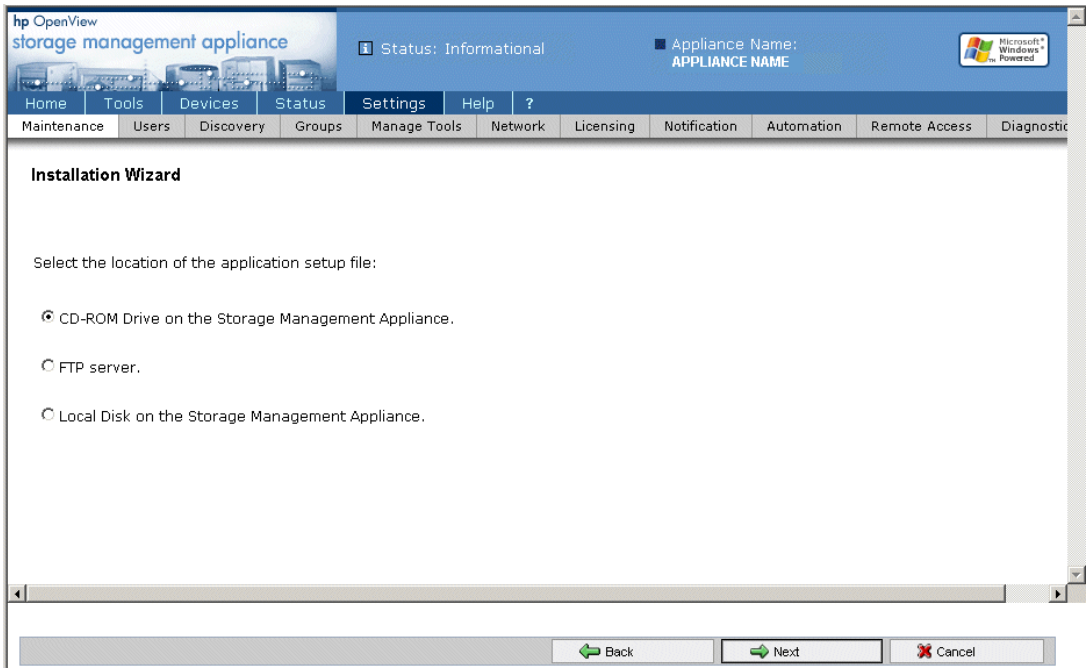

Figure 28: Storage Management Appliance software—Installation Wizard—installation types

4. Choose **CD-ROM Drive on the Storage Management Appliance**.
5. Click **Next** at the bottom of the page.
6. Verify that the appliance name and IP address are correct.
7. Click **Next** at the bottom of the page.

8. Select **Command View EVA V3.1** from the drop-down list.
9. Click **Next**.

   The installation process begins. A status bar displays.

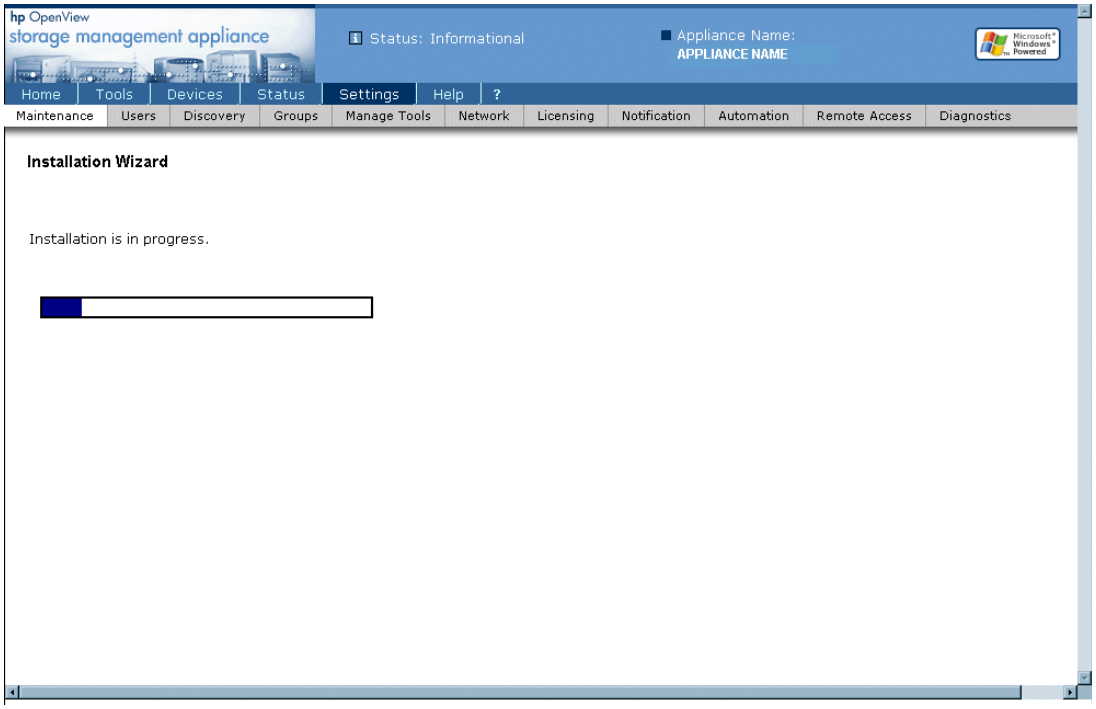

Figure 29: Storage Management Appliance software—Installation Wizard—installation in progress message

When the installation completes, the wizard displays the message `Installation is complete`.

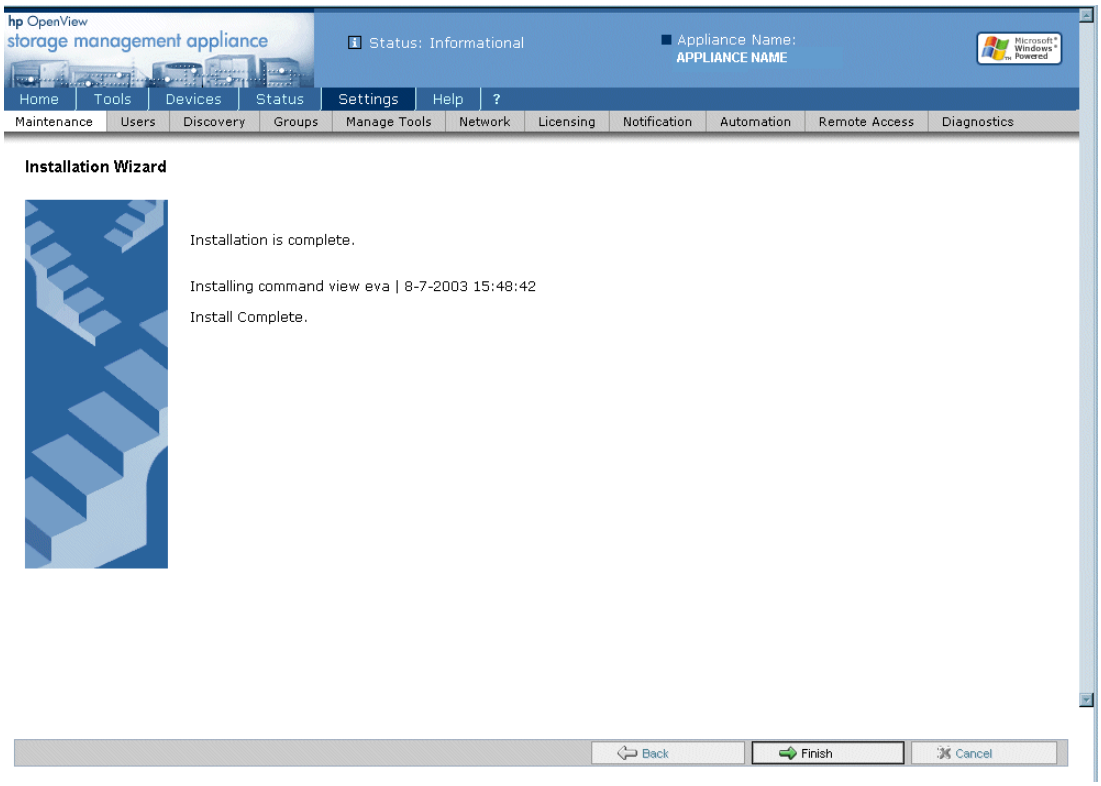

Figure 30: Storage Management Appliance software—Installation Wizard—installation complete

10. Click **Finish**.

    The management appliance returns to the Maintenance page.

11. Click **Devices** in the tool bar.

    The Devices page displays.

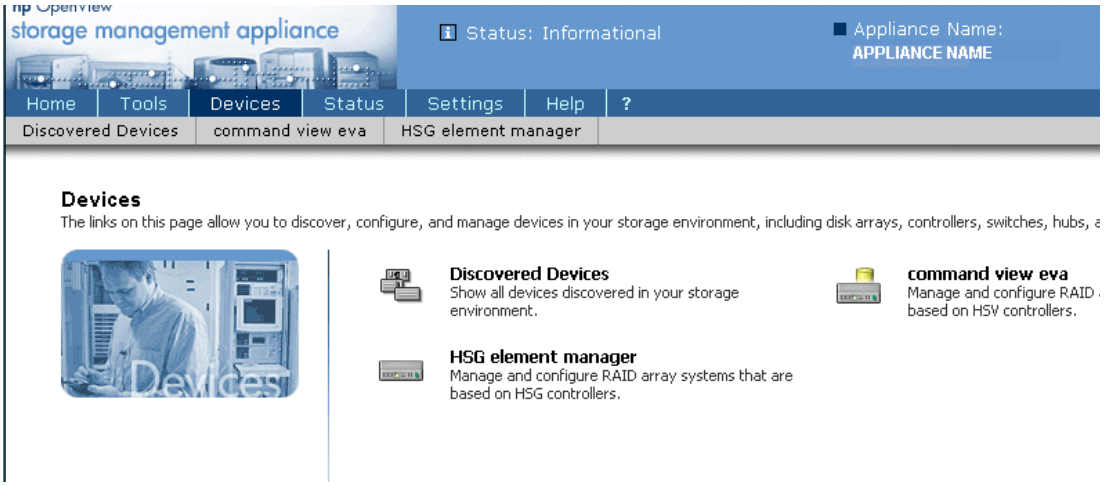

Figure 31: Storage Management Appliance software—Devices page

12. Verify that a **command view eva** entry exists on the Devices page.

    Does an entry exist?

    - Yes. Go to "Verifying the Command View EVA Version" on page 62.
    - No. Return to step 4 on page 49 to repeat the installation.

Installing Command View EVA from an FTP Server

To install Command View EVA from an FTP server, perform the following steps:

1. Click the **Install Software** option.

   An Installation Wizard page displays.
2. Click **Next** at the bottom of the page.
3. Choose **FTP Server**.
4. Click **Next** at the bottom of the page.

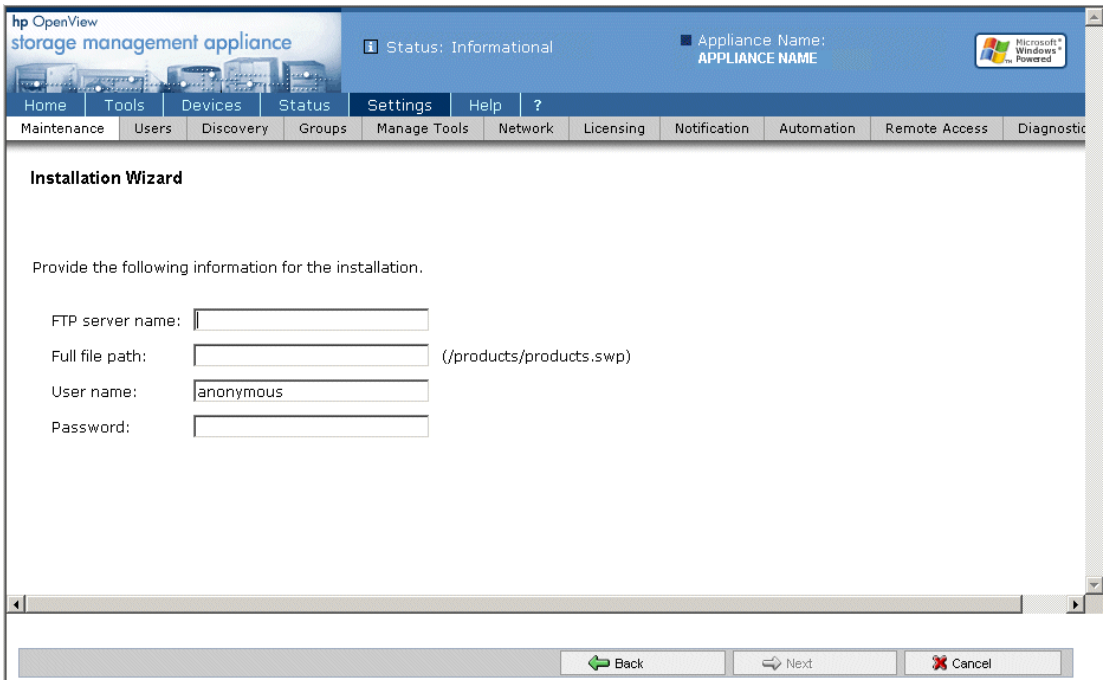

Figure 32: Storage Management Appliance software—Installation Wizard—FTP server installation

5. Type, or accept, the following information to establish an FTP network connection with the Storage Management Appliance.

Note: All entries are case sensitive.

   - For **FTP server name**, type the fully-qualified domain name of the FTP server on which the SWP files are located (or enter the IP address of the server).
   - For **Full File Path**, type the absolute path of the download folder and the *Command_View_EVA_V3_1a.swp* file name in the text box. */<download_folder_path>/Command_View_EVA_V3_1.swp*
   - For **User name**, accept the default of `anonymous`.

6. Click **Next** at the bottom of the page.

   The SWP file downloads from the FTP server and unpacks.

   The screen returns with the file display name `Command View EVA V3 1`.

7. Click **Next.** An `Installation is in progress` message displays. A status bar displays.

   When the installation completes, the wizard displays the message `Installation is complete`.

8. Click **Finish.**

   The management appliance returns to the Maintenance page.

9. Click **Devices** in the tool bar.

   The Devices page displays.

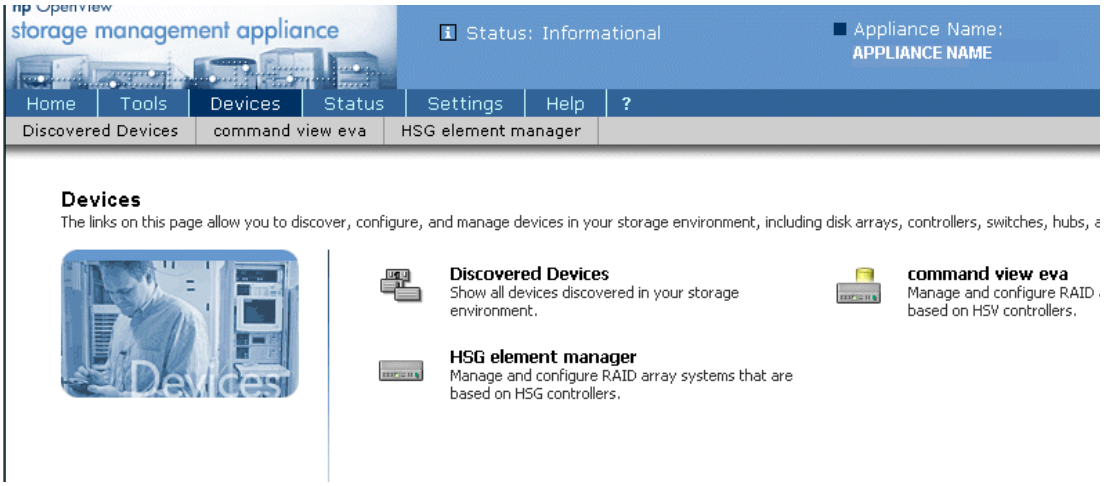

Figure 33: Storage Management Appliance software—Devices page

10. Verify that a **command view eva** entry exists on the Devices page.

    Does an entry exist?

    - Yes. Go to "Verifying the Command View EVA Version" on page 62.
    - No. Return to step 4 on page 49 to repeat the installation.

Installing Command View EVA from a Local Disk on the Storage Management Appliance

To install Command View EVA from the local disk, perform the following steps:

1. Verify that the SWP file is in the `SWPInstallKits` directory.

   To place the SWP file in the `SWPInstallKits` directory, perform the following steps:

   a. Copy the *Command_View_EVA_V3_1.swp* file to a network share accessible from the Storage Management Appliance.

   b. Open a Microsoft Terminal Services session to connect and log in to the Storage Management Appliance.

Note: If a Terminal Services session is not available, then temporarily connect a monitor, mouse, and keyboard to the Storage Management Appliance to complete this procedure.

---

   c. From the Storage Management Appliance, connect to the network share that contains the file copied in step a of this procedure.

   d. Copy the *Command_View_EVA_V3_1.swp* file to the following Storage Management Appliance directory: `C:\SWPInstallKits`

Note: Make sure that the .SWP file is in the *c:\SWPInstallKits* directory. The Installation Wizard looks for the .SWP file in this directory.

Verify that the *c:\temp\installdownload* directory does not exist on the management appliance. If this directory does exist, delete it. If you cannot delete the installdownload directory, reboot the appliance and then delete the installdownload directory.

The product software is now ready for installation.

e. Disconnect from the share drive.

f. Log out of the Terminal Services session or disconnect the monitor, mouse, and keyboard.

2. Click the **Install Software** option.

   An Installation Wizard page displays.

3. Click **Next** at the bottom of the page.

4. Choose **Local Disk on the Storage Management Appliance**.

5. Click **Next** at the bottom of the page.

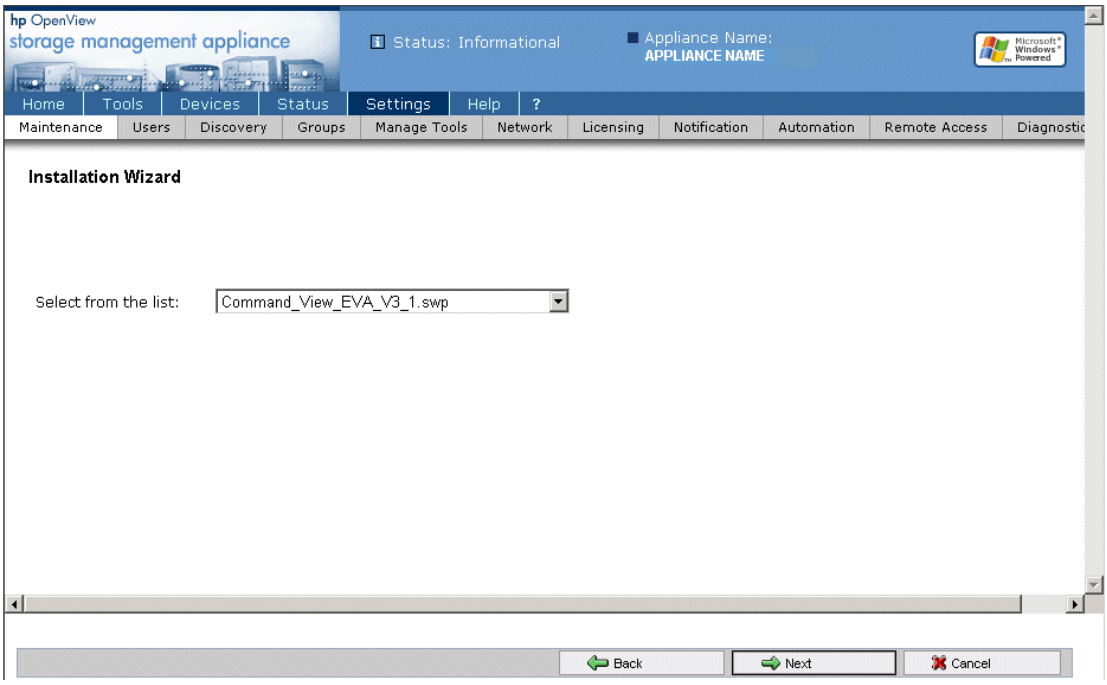

Figure 34: Storage Management Appliance software—Installation Wizard—local disk installation

6. Choose **Command_View_EVA_V3_1.swp** from the drop-down list.

Note: If the file name does not display in the drop-down list, verify that the .SWP file is located in the `C:\SWPInstallKits` directory.

7. Click **Next** at the bottom of the page.

   The screen returns with the file display name `Command View EVA V3 1`.

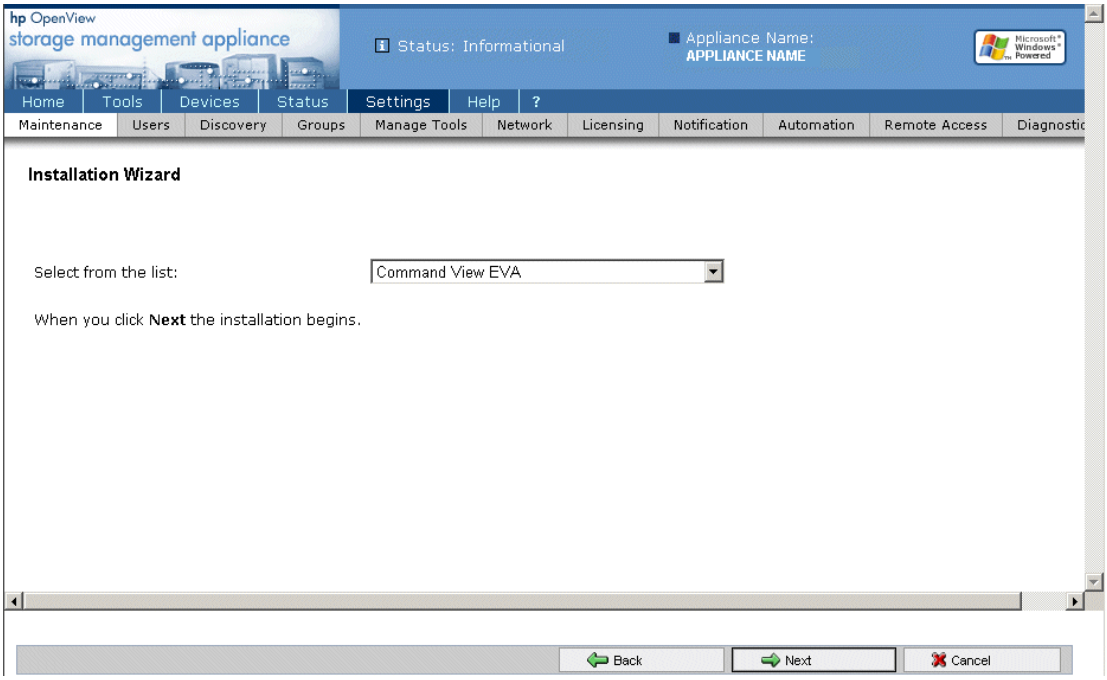

Figure 35: Storage Management Appliance software—Installation Wizard—select file

8. Click **Next.** An `Installation is in progress` message displays. A status bar displays.

   When the installation completes, the wizard displays the message `Installation is complete`.

9. Click **Finish**.

   The management appliance returns to the Maintenance page.

10. Click **Devices** in the tool bar.

    The Devices page displays.

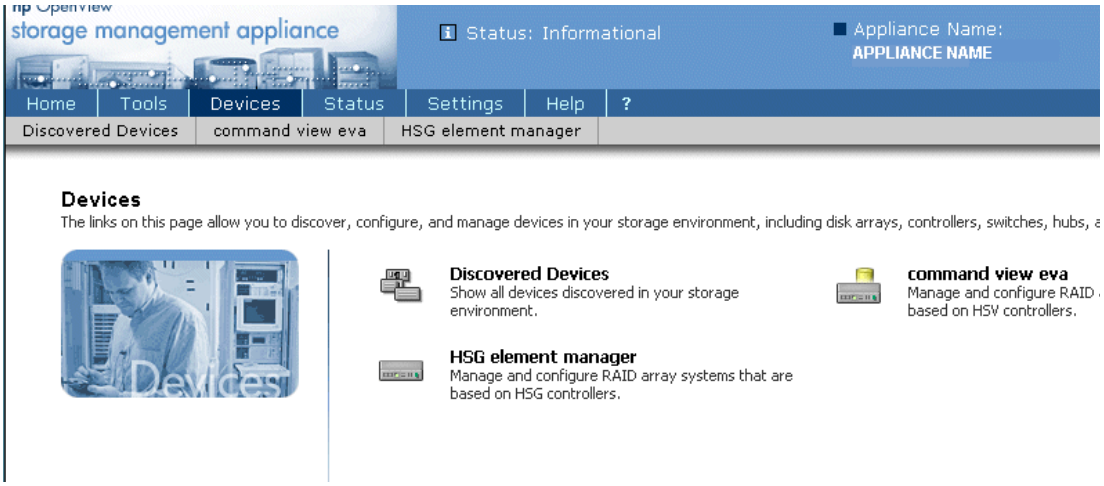

Figure 36: Storage Management Appliance software—Devices page

11. Verify that a **command view eva** entry exists on the Devices page.

    Does an entry exist?

    - Yes. Go to "Verifying the Command View EVA Version" on page 62.
    - No. Return to step 4 on page 49 to repeat the installation.

Verifying the Command View EVA Version

To verify the Command View EVA version, perform the following steps:

1. Launch the Storage Management Appliance software. (See step 2 on page 48.)
2. Log in to the Storage Management Appliance software using a valid username and password.

Note: You must have administrator privileges.

3. Click **Devices** in the tool bar.

   The Devices page displays.
4. Click **command view eva**.

The Storage Management Appliance Software launches Command View EVA, and the HSV Storage Network Properties page displays.

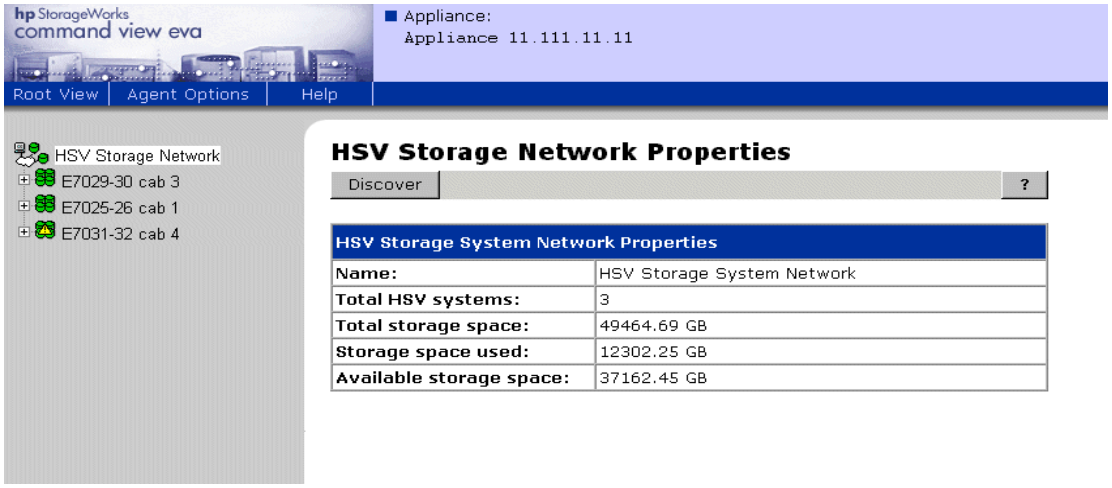

Figure 37: Command View EVA—HSV Storage Network Properties page

5. Click **Help** in the Session pane.

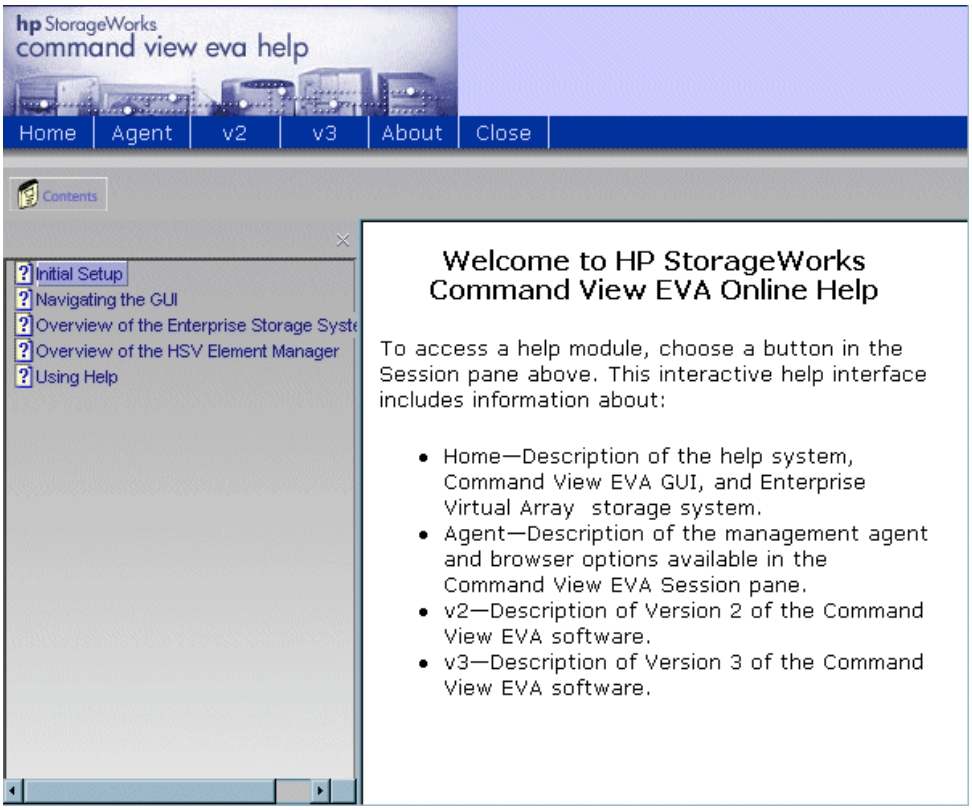

Figure 38: Command View EVA Online Help

6. Click **About** in the Help tool bar.

   The About page displays the software version of Command View EVA.

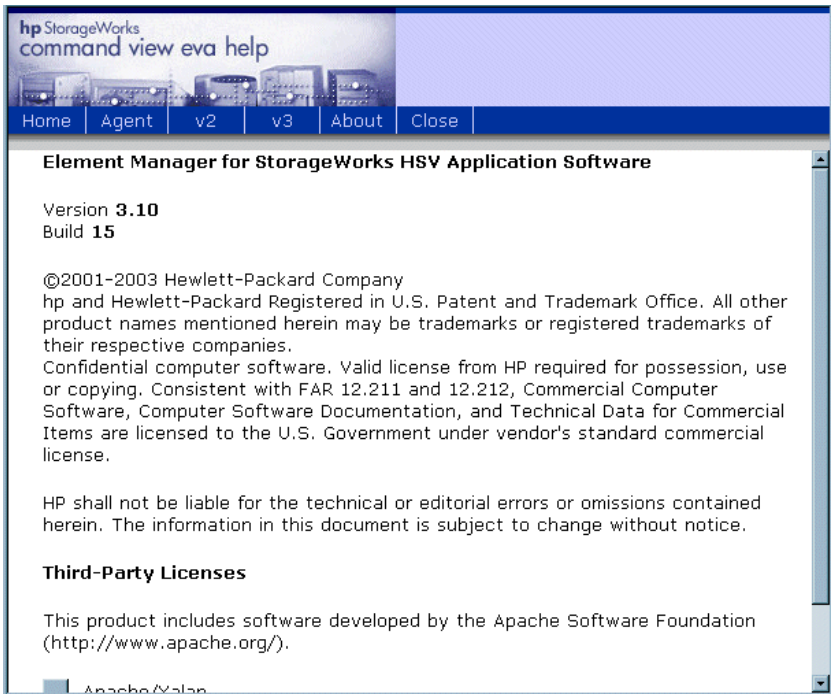

Figure 39: Command View EVA Help—About page

Note: If you are not using a recommended browser version and JRE (see Table 3 on page 17), you should update your browser version and JRE now.

Step 7: Loading the Add-on Licenses

Estimated Time to Complete

5 minutes per license

If you are upgrading several storage systems in a SAN, the recommended action is to upgrade all of your licenses at the same time. You can add licenses for Business Copy EVA and Continuous Access EVA.

See the *HP StorageWorks Business Copy EVA License Instructions* and the *HP StorageWorks Continuous Access EVA V1.1 Getting Started Guide* for more information about obtaining licenses for Business Copy EVA and Continuous Access EVA, respectively.

Please contact your HP sales representative if you require licenses for Business Copy EVA and Continuous Access EVA.

To add a license key, perform the following steps:

1. Launch Command View EVA in your browser.
2. Click **Agent Options** in the Session pane.

   The Management Agent Options page displays.

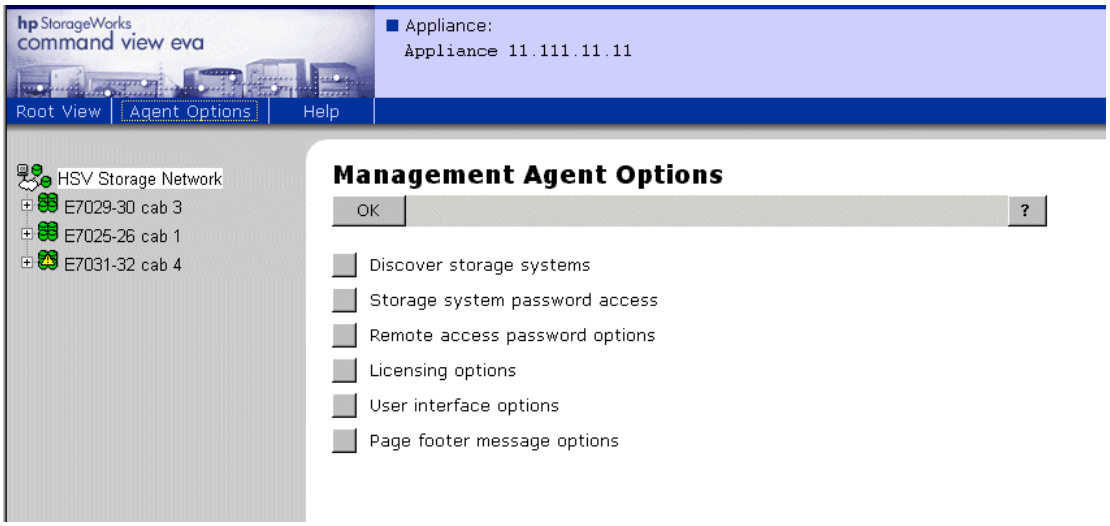

Figure 40: Command View EVA—Management Agent Options page

3. Click **Licensing options**.

   The Licensing Options page displays.

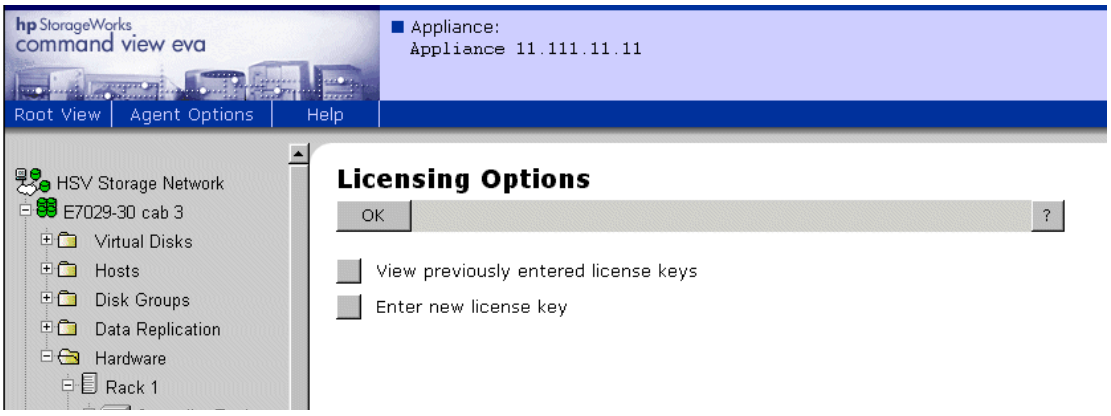

Figure 41: Command View EVA—Licensing Options page

4. Click **Enter new license key**.

   The Add a license page displays.

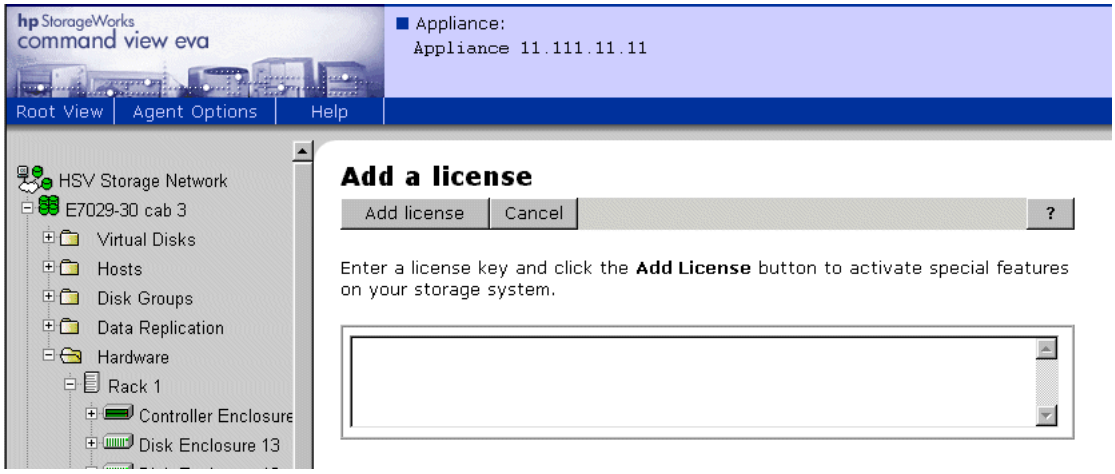

Figure 42: Command View EVA—Add a license page

5. Copy the license text from the email you received from the license key fulfillment Web site.
6. Paste the license text into the text box.

Note: You must enter the license key exactly as it is written in the email you received from the license key fulfillment Web site.

---

7. Click **Add license**.
8. To enter additional license keys, repeat step 5 through step 7 for each license key.
9. Click **Cancel** or click an icon in the Navigation pane to leave the Add a license page.

Step 8: Upgrading the VCS/Storage System Software to v3.014

Estimated Time to Complete

45 minutes

Before you can perform an online upgrade of the storage system software to v3.014 (which includes VCS v3.014), you must be running VCS v2.006 (or higher) on the HSV controllers. If you need assistance in upgrading to VCS v2.00x from VCS 1.00x, please refer to *SANworks by Compaq Upgrade Instructions for Enterprise Virtual Array v2.0* or contact an HP Authorized Service Representative.

Table 12 describes the proper upgrade paths to VCS v3.014.

Table 12: VCS/Storage System Software Upgrade Paths

Current VCS/Storage System Software Version	Upgrade Path
1.021	If you are running v1.021, you must upgrade to a later version. Please contact an HP Authorized Service Representative to assist you.
2.000 2.001 2.002 2.003 2.004 2.005	1. Upgrade to v2.006.[1, 2] 2. Upgrade to v3.014.
2.006	Upgrade to v3.014.
3.000 3.001 3.010	Upgrade to v3.014.

1. If you have a Windows 2000 host, you must perform an offline upgrade to upgrade the storage system software from v2.000 to v2.006.
2. You must upgrade to VCS v2.006 before you upgrade to VCS v3.014.

The following procedure describes an online upgrade of the storage system software. HP recommends that you perform an online upgrade when you upgrade from one storage system software version to the next.

You can also perform an offline upgrade of the storage system software. The offline upgrade requires you to stop the applications on the host machines to avoid host access to the storage system. The offline upgrade is described in step 4 on page 69 of the system software upgrade procedure.

Note: If you have a Continuous Access configuration, HP recommends that you perform an offline upgrade.

To upgrade the storage system software (including VCS on the HSV controllers), perform the following steps:

Note: Make sure you add the required license keys before you upgrade the VCS version. See "Step 7: Loading the Add-on Licenses" on page 65 for more information about adding license keys. See "Required Licenses" on page 18 for information about license versions.

1. Open Command View EVA in your browser.
2. Select a storage system in the Navigation pane.

Note: You can select an unitialized or initialized storage system.

The properties page for the selected storage system displays.

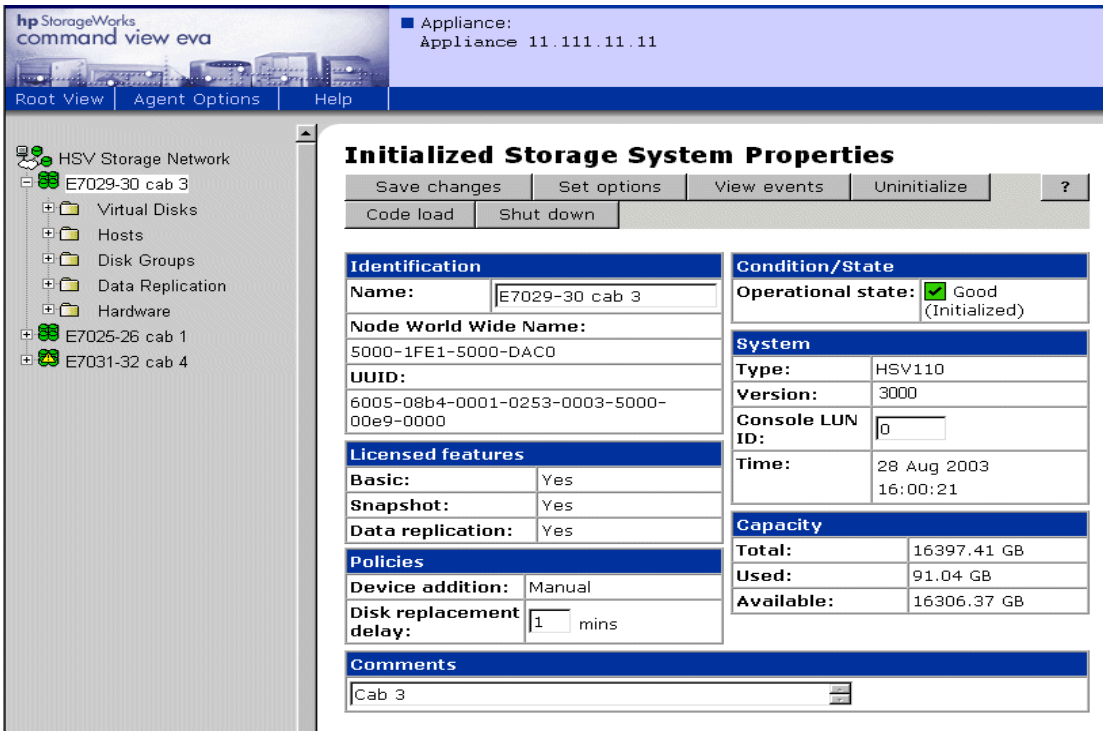

Figure 43: Command View EVA—Initialized Storage System Properties page

3. Check the status of all hardware components in the storage system. Clear all of the hardware errors before proceeding to the next step.

Caution: If you do not clear all of the hardware errors before you load the new system software, you risk losing all hardware-related error reports after you load the new system software.

4. (Optional) If you are performing an offline upgrade, stop all applications running on the host machines that have access to the storage system you are upgrading. After you have completed the storage system software upgrade, you can start the applications on the host machines.

Caution: You cannot load code onto the controllers if:

- The storage configuration is being changed in any way.

  Wait until all configuration changes are completed in the Command View EVA before proceeding with a code load.
- In a Continuous Access EVA configuration, a DR group is logging, merging, leveling, or copying.

  Click the DR group icon in the Navigation pane. Check the **Log State** in the DR Group Properties page.
- In a Continuous Access EVA configuration, the connection between the storage systems is compromised.

  Click the Data Replication folder in the Navigation pane. Check the **Connection State** in the Data Replication Folder Properties page.

If you attempt to load code onto the controllers before the above conditions are met, controller operation will fail.

In a Continuous Access configuration, after you load code onto the first controller pair (for example, the source controller pair), you must wait at least three minutes, or until the preceding conditions are met on the second controller pair.

---

5. Click **Code load**.

   A confirmation message displays.

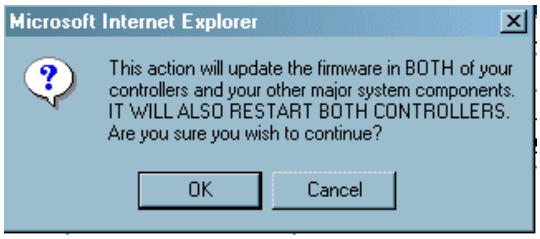

Figure 44: Command View EVA—first code load confirmation message

6. Click **OK**.

   The Code Load Storage System-Page 1 displays.

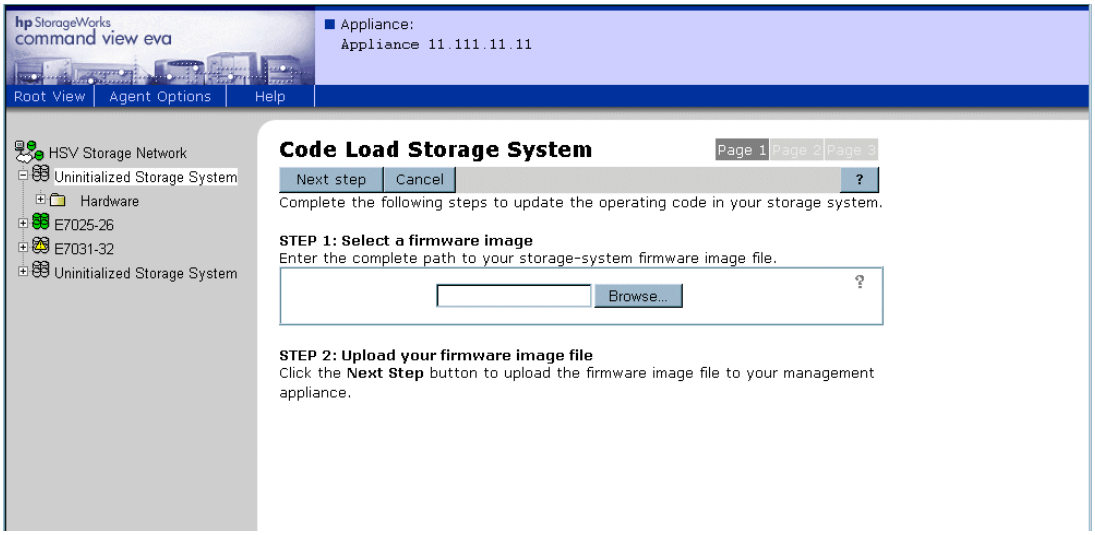

Figure 45: Command View EVA—Code Load Storage System-Page 1

7. Click **Browse** and select the file containing version 3.014 of the storage system software.

   For an EVA5000 storage system, select the filename *vcsp_cr0328.sss*.

   For an EVA3000 storage system, select the filename *runp_cr0328.sss*.
8. Click **Next Step**.

   The Code Load Storage System-Page 2 displays.

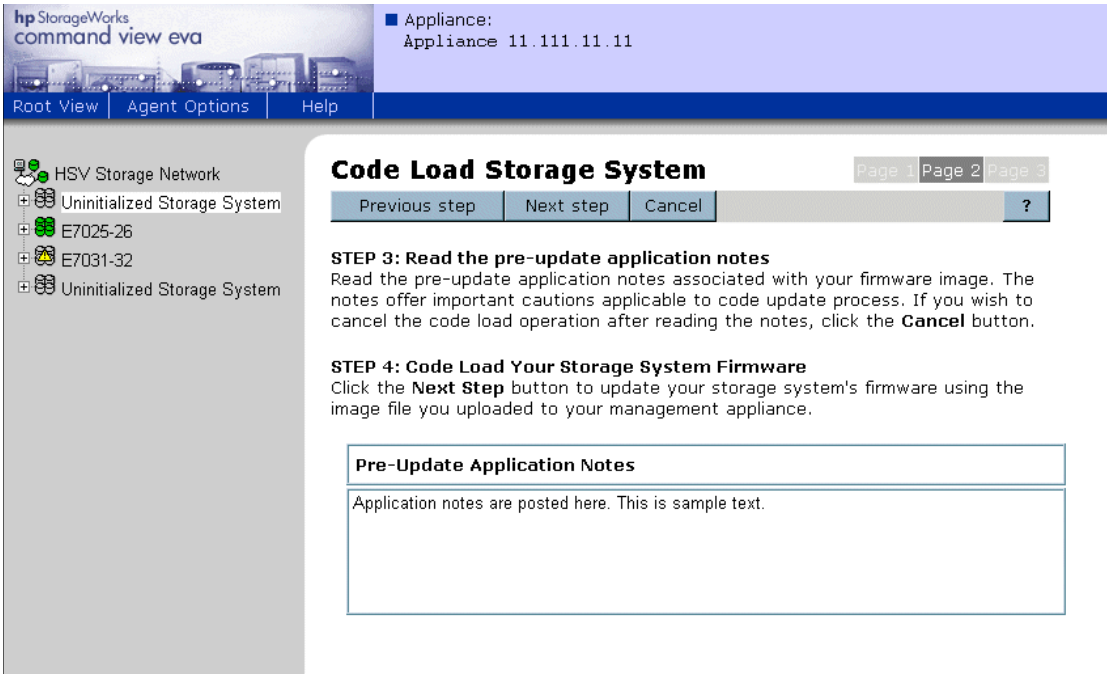

Figure 46: Command View EVA—Code Load Storage System-Page 2

9. Click **Next Step**.

   A confirmation message displays.

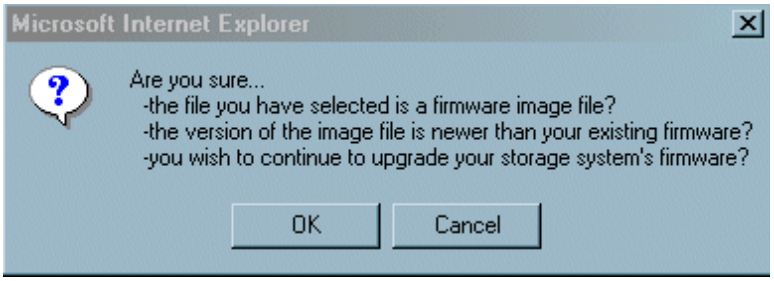

Figure 47: Command View EVA—file confirmation message

10. Click **OK**.

    An upgrade confirmation message displays.

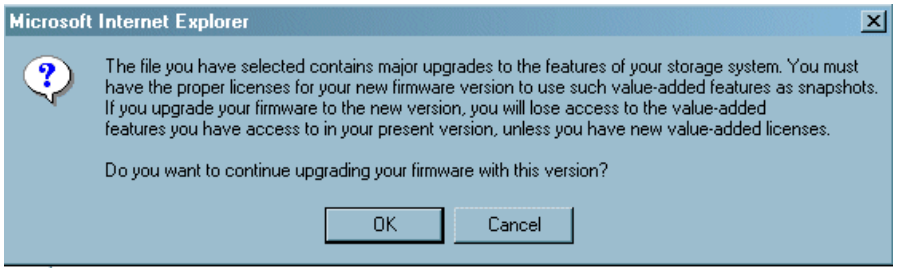

Figure 48: Command View EVA—upgrade confirmation message

11. Click **OK** to confirm that you have the proper licenses.

    The new storage system software is loaded onto the HSV controllers, and the firmware on the associated Fibre Channel drive enclosures is upgraded.

    During this process, a command in progress message displays.

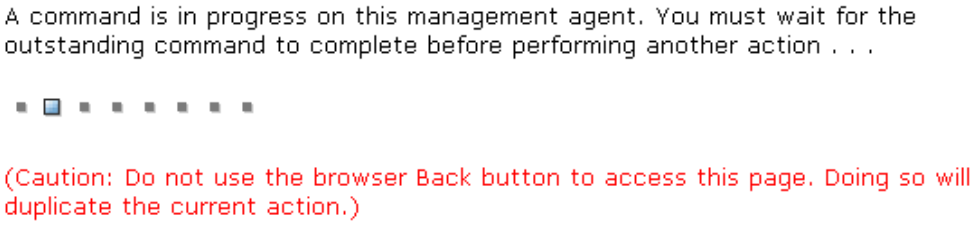

Figure 49: Command View EVA—command in progress message

The Code Load Storage System-Page 3 displays. The HSV controllers restart.

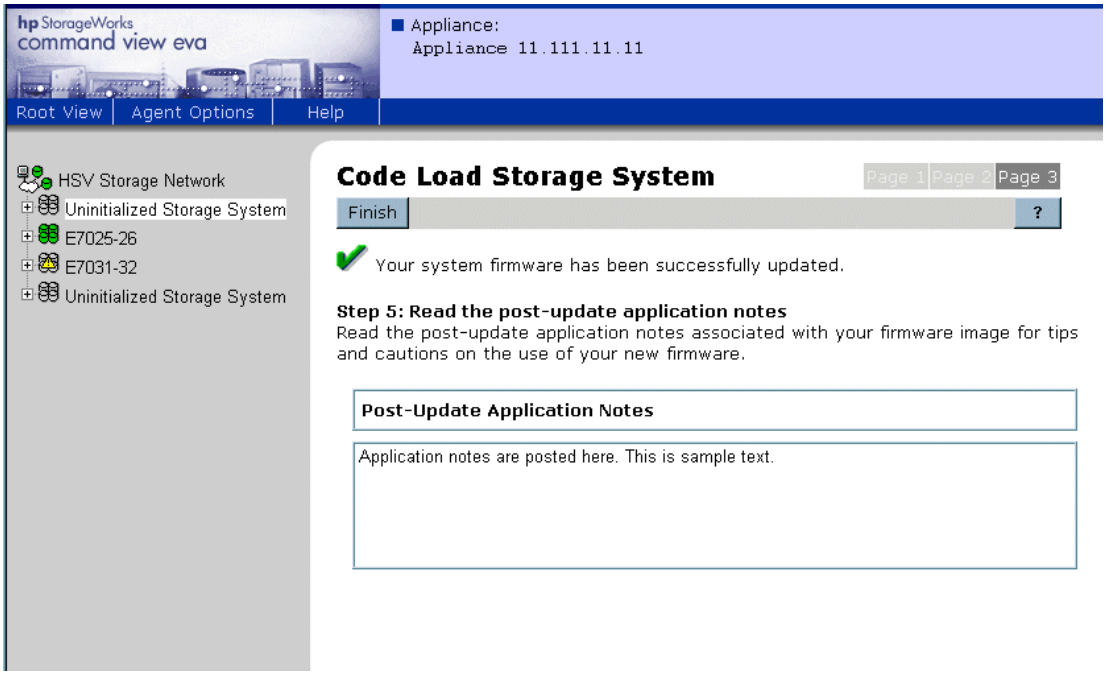

Figure 50: Command View EVA—Code Load Storage System-Page 3

Note: The software loads in parallel on the drive enclosures. During the software update, the EMUs on the drive enclosures might flash red LEDs, sound an alarm, and display the ID. After the software update completes, the flashing red LEDs and alarm sound cease. The process of updating the enclosure software continues in the background after the controller software is updated.

During the EMU firmware upgrade, all of the disk drives are listed in the Unmappable Hardware folder and all of the disk enclosure bays disappear from the navigation tree. The firmware upgrade can take up to 10 minutes to complete. After the upgrade has completed, the disk enclosure bays are listed under the Disk Enclosure elements.

The software loads on the HSV controllers. The HSV controllers synchronize using the new software. The `Scanning for disks` message on the controllers' OCPs indicates that synchronization is taking place.

---

12. Click **Finish** after the HSV controllers have restarted.

    The Command View EVA client refreshes.

    An EMU firmware update message displays.

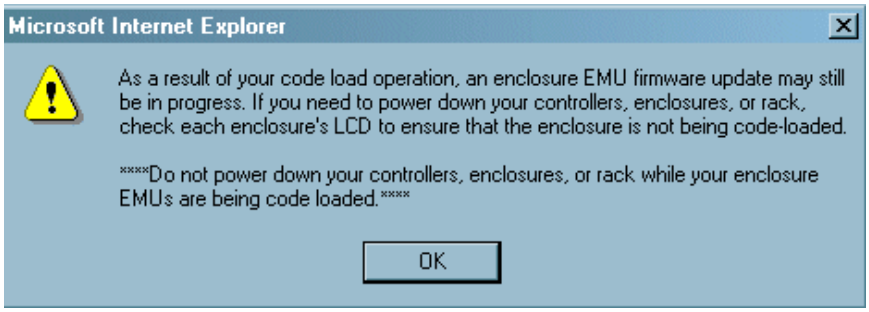

Figure 51: Command View EVA—EMU firmware update message

13. Click **OK**.
14. Refresh the browser.
    - In Internet Explorer, press **Ctrl** and click **Refresh** in the tool bar.
    - In Netscape Navigator, press **Shift** and click **Reload** in the tool bar.
15. Click the storage system icon in the Navigation pane to verify the version of the storage system software.

    The Initialized Storage System Properties page displays.

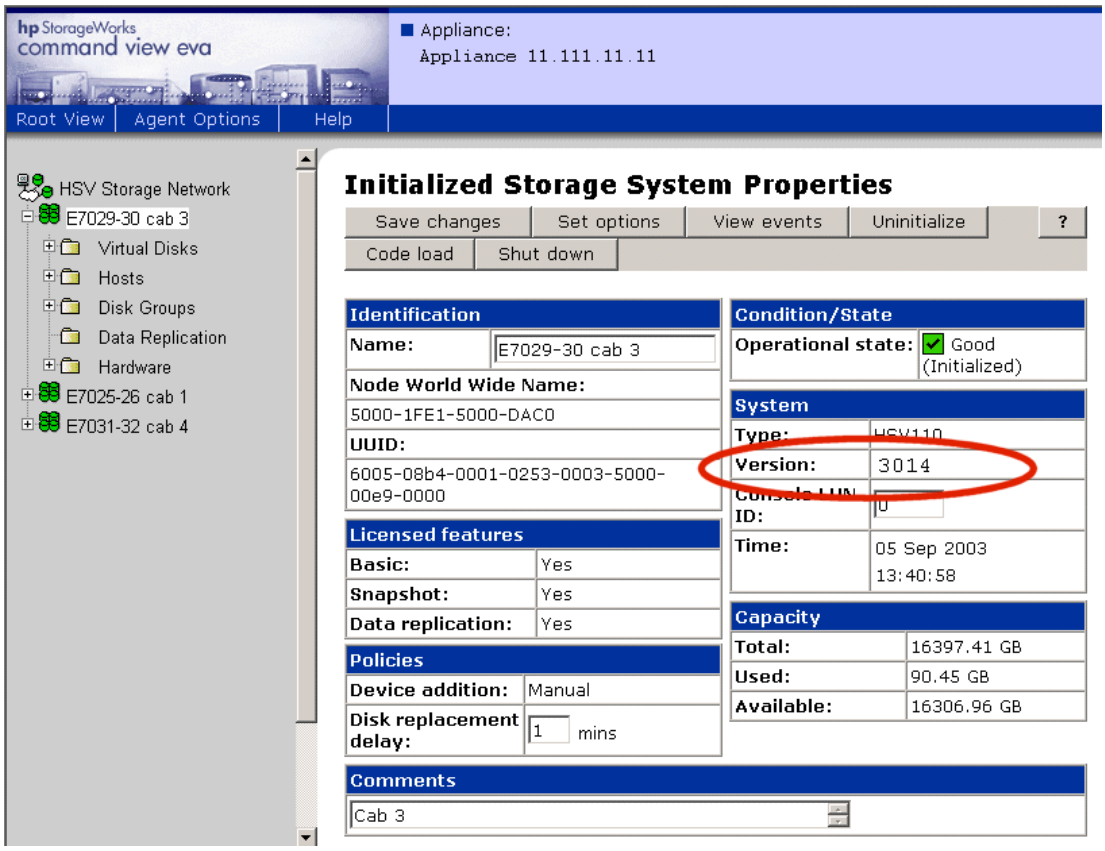

Figure 52: Command View EVA—Initialized Storage System Properties page

Step 9: Adding Passwords to the HSV Controllers (optional)

Estimated Time to Complete

15 minutes

Use the following procedure to add a password to the HSV controller pair.

Note: When you add a system password to the controller, you must enable password access in the Command View EVA with access to this system.

Using the OCP on the HSV controller:

1. Press ▶ to leave the default display.
2. Press ▼ four times to scroll to System Password.
3. Press ▶ to select System Password.
4. Press ▶ to display CHANGE PASSWORD? NO.
5. Press ▼ to display CHANGE PASSWORD YES.
6. Press ▶ to accept YES and go to step 7.
7. Press either ▲ or ▼ to select an uppercase or lowercase character.
8. Press ▶ to accept a character and select the next password character. The character display changes to an asterisk.
9. Repeat step 7 and step 8 for the remaining seven characters.
10. Press ◀ to accept the password.

    The password is changed. The system automatically returns to the default display.
11. Enable password access to the storage system in Command View EVA.

Enabling Password Access in Command View EVA

Estimated Time to Complete

10 minutes

To enable password access to a storage system, perform the following steps:

1. Launch Command View EVA in your browser.
2. Click **Agent Options** in the Session pane.

   The Management Agent Options page displays.
3. Click **Storage system password access**.

   The Storage System Password Access page displays
4. Click **Enable**.

The Enable Password Access to a Storage System page displays.

Figure 53: Command View EVA—Enable Password Access to a Storage System page

5. Select the World Wide Node Name of the storage system for which you want to enable password access.
6. Type the password in the **Password** and **Confirm password** fields.

Note: Make sure you use the same password you entered into the HSV controller OCP.

---

7. Click **Enable Password**.

   A message box displays.
8. Click **OK**.

   Command View EVA enables password access to the storage system.

Step 10: Installing SMI-S EVA (optional)

HP StorageWorks SMI-S EVA v1.01.00 provides the Storage Management Initiative Specification (SMI-S) interface for the management of HP StorageWorks EVA arrays.

Refer to the *HP StorageWorks SMI-S EVA V1.01 Installation Instructions* for information on how to plan and install the SMI-S EVA interface module.

Installing SMI-S EVA from a CD-ROM

Use the following procedure to install SMI-S EVA v1.01.00 on the Storage Management Appliance from the Command View EVA CD:

1. Close all browser windows, Microsoft Management Console (MMC) sessions, Terminal Services sessions, and Java applets that are open on the Storage Management Appliance.
2. From a client computer, launch a Web browser and browse to the Storage Management Appliance using the following format:

   `http://<appliance_name>:2301`

Note: The default appliance name for a Storage Management Appliance (hardware version 1.0) begins with *swma* and includes the last 6 characters of the appliance serial number.

If the SMA software was restored using the Quick Restore CD v2.0, then the default appliance name begins with *sma* and includes all 12 characters (10 characters for Storage Management Appliance III) of the appliance serial number.

The default appliance name for an SMA II begins with *sma* and includes all 12 characters (10 characters for Storage Management Appliance III) of the appliance serial number.

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3. Enter your **User Name** and **Password** in the **Enter Network Password** dialog box and click **OK**.

   The Storage Management Appliance software home page displays.
4. Click **Settings**.
5. Click **Maintenance**.
6. Click **Install Software**.

   An Installation Wizard page displays.

Note: Reinstallation of SMI-S EVA is not supported. If necessary to reinstall SMI-S EVA, remove the installed SMI-S EVA and then proceed with a new installation.To uninstall SMI-S EVA refer to the *HP StorageWorks SMI-S EVA V1.01 Installation Instructions.*

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7. Click **Next** at the bottom of the page.
8. Select **CD-ROM Drive on the Storage Management Appliance** and click **Next** at the bottom of the page.
9. When prompted, insert the SMI-S EVA CD in the Storage Management Appliance CD-ROM drive if not previously positioned.
10. Choose **SMI-S EVA** from the drop-down list.

11. Click **Next** to initiate the installation.

    The following displays:

    ```
    Installation is in progress.
    ```

    Time to completion depends on the size of the application and the network connection speed. After installation completes, the following displays:

    ```
    Installing hp StorageWorks SMI-S for EVA V10000
    Install Complete
    ```

Note: In some cases, the display may indicate `Rebooting this Appliance`.
If an installation fails for any reason, the Storage Management Appliance does not permit a subsequent installation attempt for one hour following the failed attempt. Attempting an installation during this one hour period causes an error message to display.

12. Click **Finish**.
13. Verify that an **hp StorageWorks SMI-S for EVA** entry exists on the Storage Management Appliance software **Manage Tools** page. To display the **Manage Tools** page, click **Settings** on the Storage Management Appliance home page, and then click **Manage Tools** on the **Settings** page.
14. Answer the following:

    `Does an entry exist?`

    - If Yes, stop. The installation is complete.
    - If No, return to step 8 to repeat the installation.

Step 11: Upgrading Business Copy EVA (if installed)

Estimated Time to Complete

45 minutes

If you installed a Business Copy EVA v2.2 license in "Step 7: Loading the Add-on Licenses" on page 65, you will have to upgrade to Business Copy EVA v2.2 on your host servers and host agents. For complete upgrade instructions, please refer to the following documents:

- *HP StorageWorks Business Copy EVA/MA/EMA Host Agent v2.2 for HP OpenVMS Installation Guide*
- *HP StorageWorks Business Copy EVA/MA/EMA Host Agent v2.2 for HP Tru64 UNIX Installation Guide*
- *HP StorageWorks Business Copy EVA/MA/EMA Host Agent v2.2 for HP-UX Installation Guide*
- *HP StorageWorks Business Copy EVA/MA/EMA Host Agent v2.2 for IBM AIX Installation Guide*
- *HP StorageWorks Business Copy EVA/MA/EMA Host Agent v2.2 for Sun Solaris Installation Guide*
- *HP StorageWorks Business Copy EVA/MA/EMA Host Agent v2.2 for Windows Installation Guide*
- *HP StorageWorks Business Copy EVA/MA/EMA Server v2.2 Installation Guide*

If you are running Business Copy EVA and Continuous Access EVA, you should also read *HP StorageWorks Business Copy EVA/MA/EMA v2.2 Using BC with Continuous Access EVA and Data Replication Manager Application Notes*.

Step 12: Upgrading Continuous Access EVA (if installed)

Estimated Time to Complete

45 minutes

If you installed a Continuous Access EVA v1.1 license in "Step 7: Loading the Add-on Licenses" on page 65, you will have to upgrade Continuous Access EVA on the Storage Management Appliance. For complete upgrade instructions, please refer the *HP StorageWorks Continuous Access User Interface V1.1a Installation Guide.*

Step 13: Migrating Network View to Storage Area Manager

Estimated Time to Complete

45 minutes

If HP SANworks Network View software is installed on your Storage Management Appliance, you must migrate your Network View environment into Storage Area Manager.

For instructions on how to remove Network View from the Storage Management Appliance, refer to the "Uninstalling SANworks Applications" section in the *HP OpenView Migrating Storage Resource Manager, Storage Allocation Reporter, and Network View to Storage Area Manager Application Notes*.

Step 14: Installing Storage Node Manager (optional)

You can install Storage Node Manager on your Storage Management Appliance, after you have installed Command View EVA v3.1. When you install Storage Node Manager, you must also install the EVA Device Plug-In (DPI). DPI allows the Storage Area Manager to support the Enterprise Virtual Array.

Refer to the *HP OpenView Storage Area Manager 3.0 Installation Guide* for information on how to prepare for and install the Storage Node Manager component.

Note: The DPI is not delivered on the Storage Area Manager CD. You can download it from the Storage Area Manager DPI website at: http://www.openview.hp.com/products/dpi. Refer to the *HP OpenView Storage Area Manager EVA Device Plug-In Installation Instructions* for information on how to plan and install the DPI.

Step 15: Disabling SNMP Notification to the PRS Host

Some Enterprise Virtual Arrays run the Proactive Remote Services (PRS) software to identify potential EVA hardware problems. PRS sends information about hardware problems to an HP Customer Support Center, which provides a solution.

The PRS software, prior to EVA v3.0, used trap-based SNMP notification to report event information about the EVA. With the releases of Enterprise Virtual Array v3.0 and v3.010, customers are encouraged to upgrade their event reporting functionality with the following tools: Proactive Remote Services (PRS) v5.0 and Web-Based Enterprise Services System Event Analyzer (WEBES-SEA) v4.3.

Note: In some regions, such as Europe, the Middle East, and Africa, the EVAs run Event Viewer EVA (EVE) v2.0 and Instant Support Enterprise Edition (ISEE) vA.02.50 daVinci instead of WEBES-SEA and PRS as their remote error notification solution. If an EVA is using EVE and ISEE, an HP Authorized Service Representative must still disable SNMP-trap notification to the PRS host.

HP strongly recommends that you discuss the installation of one of these proactive remote error notification solutions on your Storage Management Appliance with your HP Authorized Service Representative. This will allow HP to automatically monitor your EVAs for potential hardware problems.

Depending on regional requirements, an HP Authorized Service Representative will install WEBES-SEA v4.3 and PRS v5.0 or EVE and ISEE on your Storage Management Appliance.

After the proactive error notification solution is installed, an HP Authorized Service Representative will disable SNMP notification to the host on which PRS runs. If you do not disable SNMP notification to the PRS host, then Command View EVA will send multiple notifications to the PRS host.

Downgrading the Enterprise Virtual Array to v2.00x

4

If you wish to downgrade the existing VCS v3.014 to v2.000x, you may do so if your Enterprise Virtual Array contains no data and is uninitialized. You may downgrade the system software from v3.014 to v2.003 (or higher) after you upgrade the HSV Element Manager v2.x to Command View EVA v3.1. Command View EVA v3.1 is compatible with VCS v2.003 and higher.

Caution: Do not downgrade your storage system if it has been initialized or contains any data. You can only downgrade storage systems that are uninitialized and do not contain any data. If you attempt to downgrade an initialized storage system, you will lose any configuration information or data in that storage system. All existing data will be destroyed when you downgrade from v3.xxx to v2.003 (or higher).

Estimated Time to Complete

45 minutes per storage system

To downgrade the Enterprise Virtual Array system software from version 3.xxx to version 2.003 (or higher), perform the following steps:

1. Shut down and power off all presented hosts that have access to the storage system you wish to downgrade.
2. If you are running multiple storage systems in your SAN, shut down all but one of the storage systems to be downgraded.
3. On the HSV controller OCP, select Shutdown/Uninitialize System.
4. Reboot the Storage Management Appliance.
5. Open HSV Element Manager (or Command View EVA v3.0, if installed).
6. Select the storage system you wish to downgrade.
7. Click **Code load**.

   A confirmation message displays.
8. Click **OK**.

   The Code Load Storage System page displays.
9. Click **Browse** and select the file containing version 2.003 (or higher) of the storage system software from the installation CD-ROM.
10. Click **Next Step**.

    The Code Load Storage System-Page 2 displays.
11. Click **Next Step**.

    A confirmation message displays.

12. Click **OK**.

    The new storage system software is loaded onto the HSV controllers, and the firmware on the associated Fibre Channel drive enclosures is modified.

    The Code Load Storage System-Page 3 displays. The HSV controllers restart.

Note: The software loads in parallel on the FC drive enclosures. During the software update, the EMUs on the FC drive enclosures might flash red LEDs and sound an alarm. After the software update completes, the flashing red LEDs and alarm sound cease. The process of updating the enclosure software continues in the background after the controller software is updated.

During the EMU firmware downgrade, all of the disk drives are listed in the Unmappable Hardware folder and all of the disk enclosure bays disappear. The firmware downgrade can take up to 10 minutes to complete. After the downgrade has completed, the disk enclosure bays are listed under the Disk Enclosure elements.

The software loads on the HSV controllers. The HSV controllers synchronize using the new software. The `Scanning for disks` message on the controllers' OCPs indicates that synchronization is taking place.

---

13. Click **Finish** after the HSV controllers have restarted.

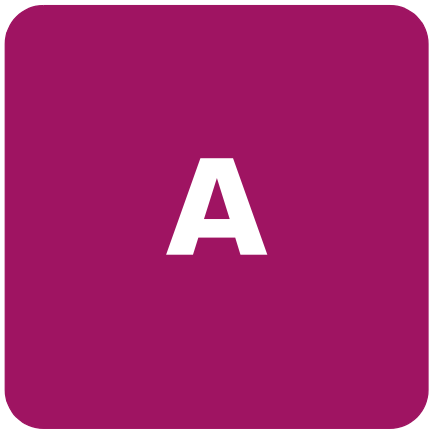
    The Command View EVA client refreshes.

    A confirmation message displays.

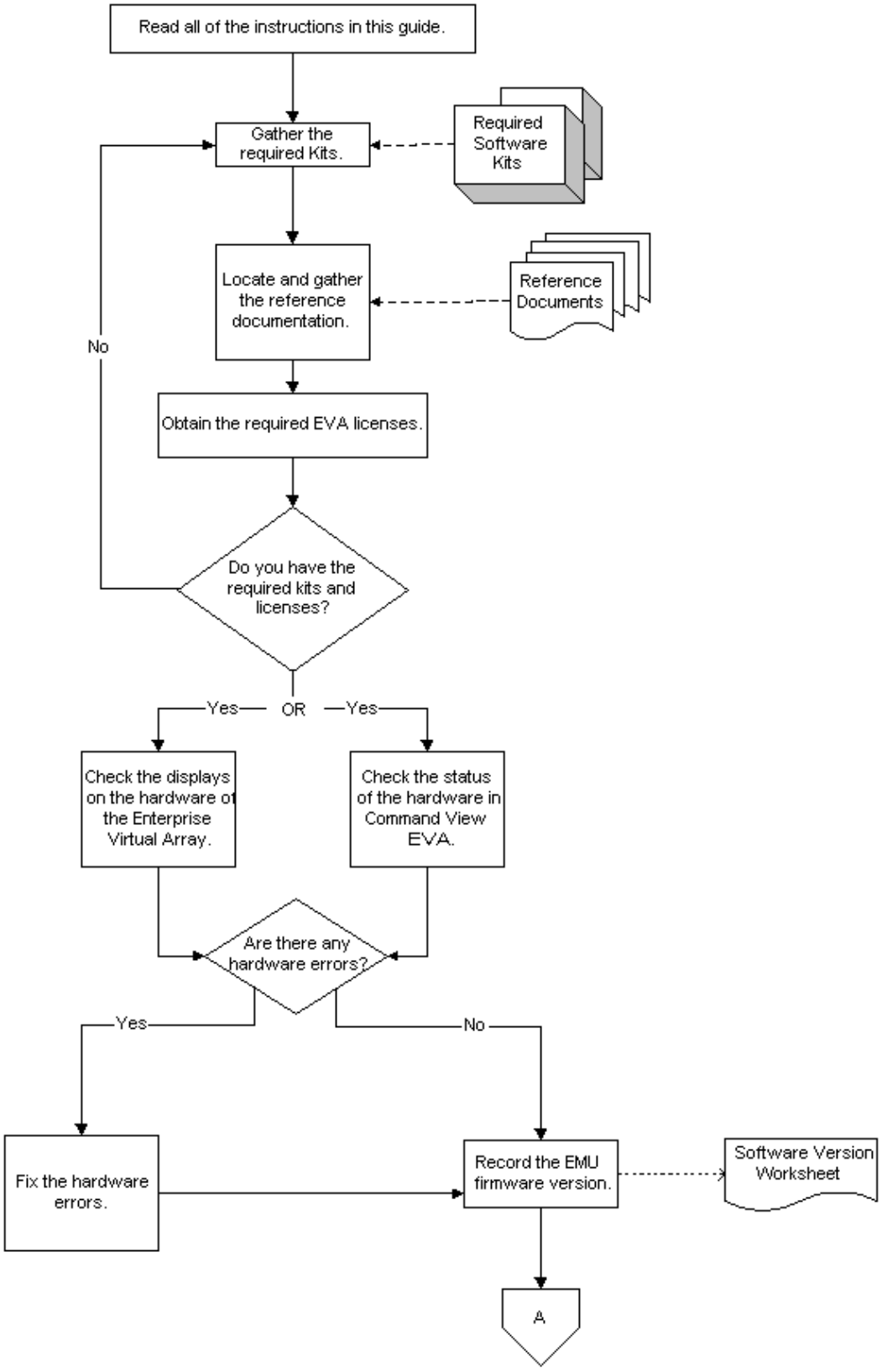
14. Click **OK**.
15. Refresh the browser.
    - In Internet Explorer, press the **Ctrl** key and click **Refresh** in the tool bar.
    - In Netscape Navigator, press the **Shift** key and click **Reload** in the tool bar.
16. Click the storage system icon in the Navigation pane to verify the version of the storage system software.
17. Power down the controllers in the storage system you downgraded.
18. Power up the next storage system to be downgraded.
19. Repeat step 3 through step 18 until you have downgraded all v3.xxx storage systems to v2.003 (or higher).
20. Reboot the Storage Management Appliance.

    All of the storage systems in your SAN have now been downgraded to v2.003 (or higher).

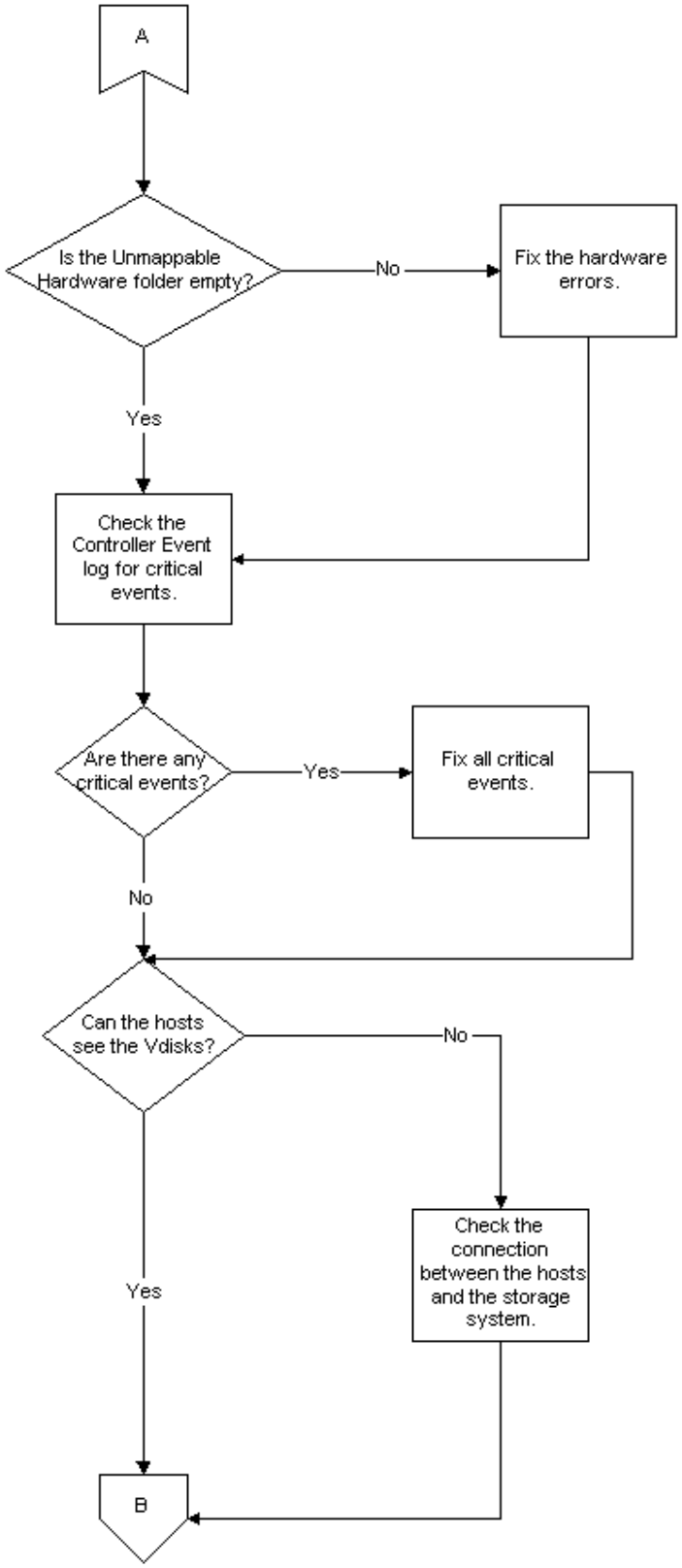
Software Upgrade Flowchart



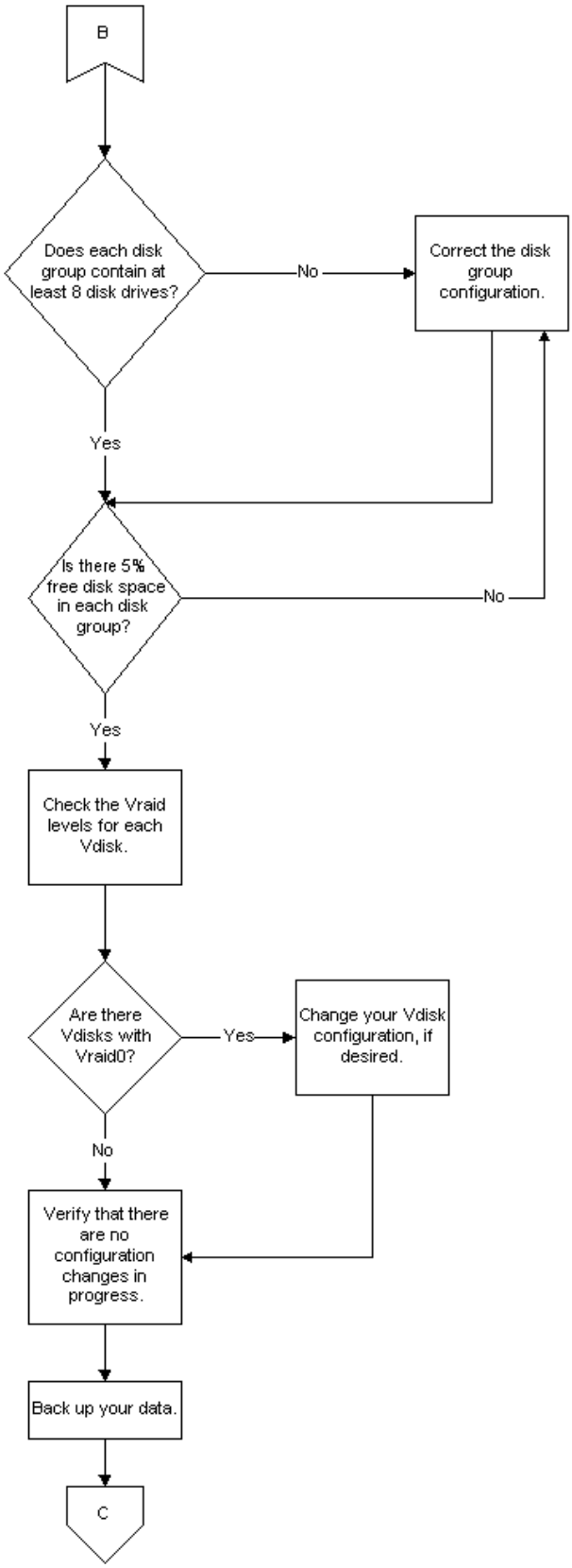
This appendix provides a flowchart of the Enterprise Virtual Array software upgrading process.


Read all of the instructions in this guide.
Gather the required Kits.
Required Software Kits
Locate and gather the reference documentation.
Reference Documents
No
Obtain the required EVA licenses.
Do you have the required kits and licenses?
Yes
OR
Yes
Check the displays on the hardware of the Enterprise Virtual Array.
Check the status of the hardware in Command View EVA.
Are there any hardware errors?
Yes
No
Fix the hardware errors.
Record the EMU firmware version.
Software Version Worksheet
A

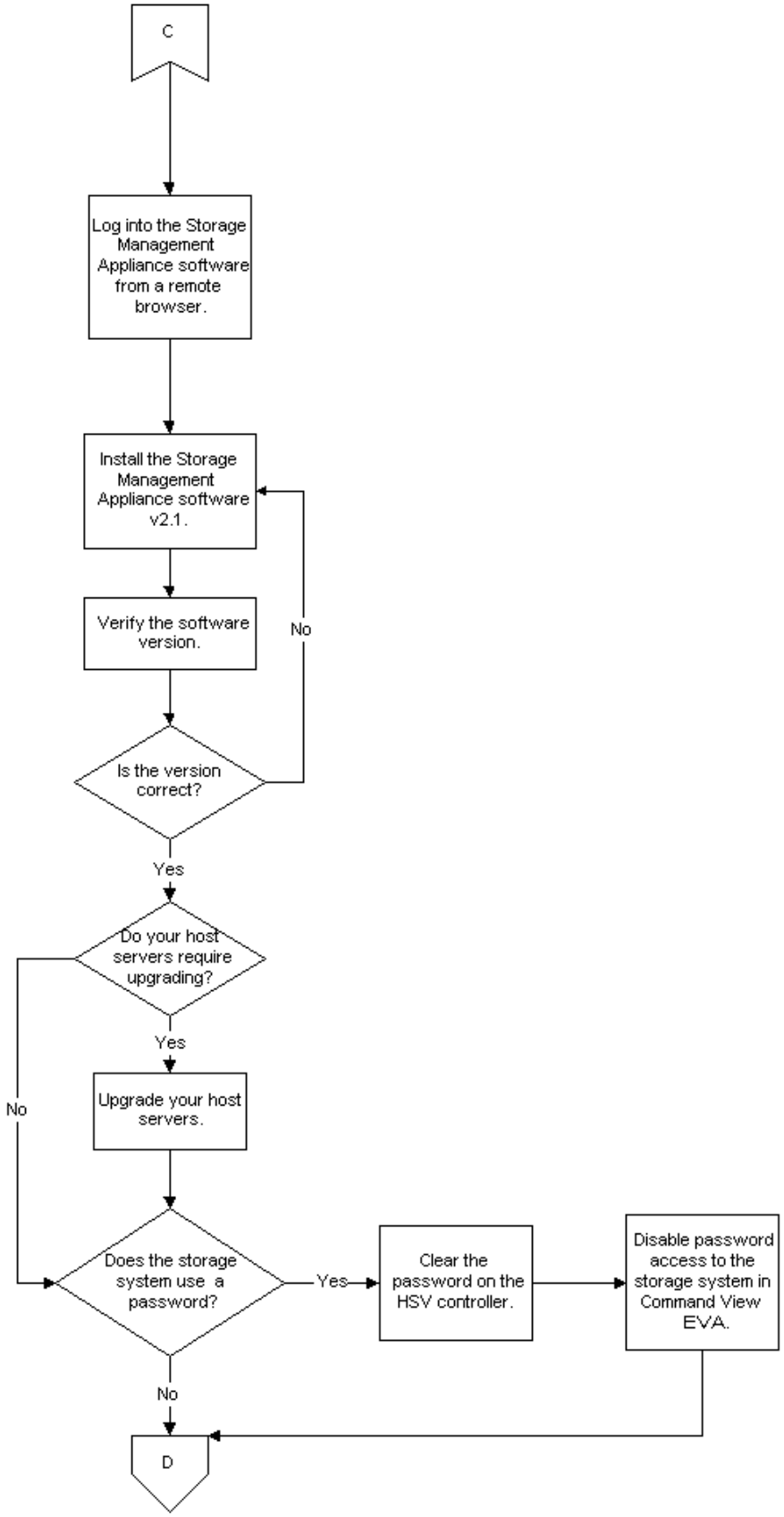
Flowchart 1


A
Is the Unmappable Hardware folder empty?
No
Fix the hardware errors.
Yes
Check the Controller Event log for critical events.
Are there any critical events?
Yes
Fix all critical events.
No
Can the hosts see the Vdisks?
No
Check the connection between the hosts and the storage system.
Yes
B

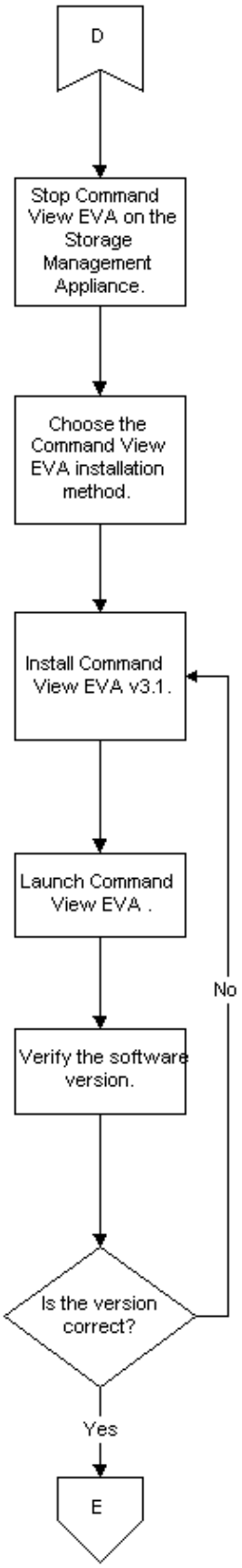
Flowchart 2


B
Does each disk group contain at least 8 disk drives?
No
Correct the disk group configuration.
Yes
Is there 5% free disk space in each disk group?
No
Yes
Check the Vraid levels for each Vdisk.
Are there Vdisks with Vraid0?
Yes
Change your Vdisk configuration, if desired.
No
Verify that there are no configuration changes in progress.
Back up your data.
C

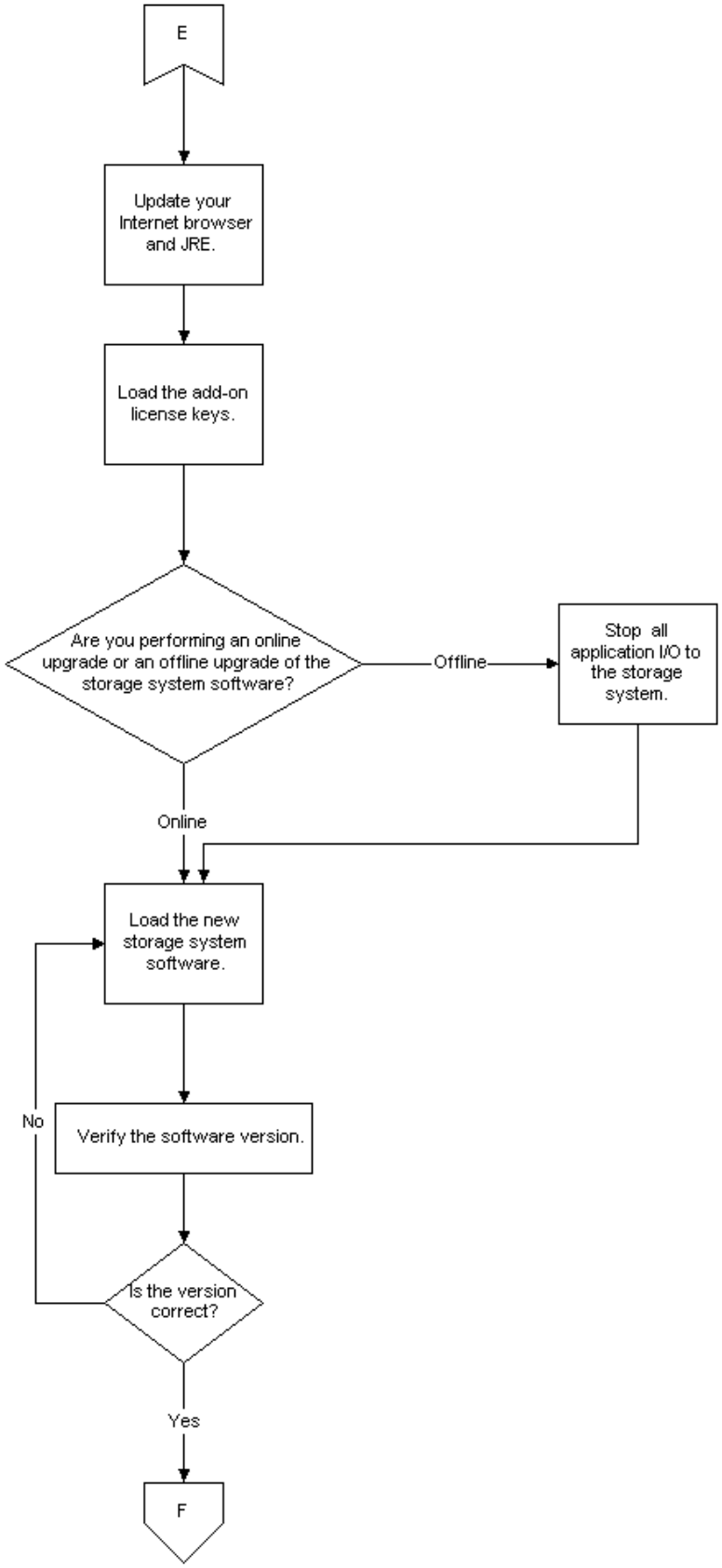
Flowchart 3


C
Log into the Storage Management Appliance software from a remote browser.
Install the Storage Management Appliance software v2.1.
Verify the software version.
No
Is the version correct?
Yes
Do your host servers require upgrading?
Yes
No
Upgrade your host servers.
Does the storage system use a password?
Yes
Clear the password on the HSV controller.
Disable password access to the storage system in Command View EVA.
No
D

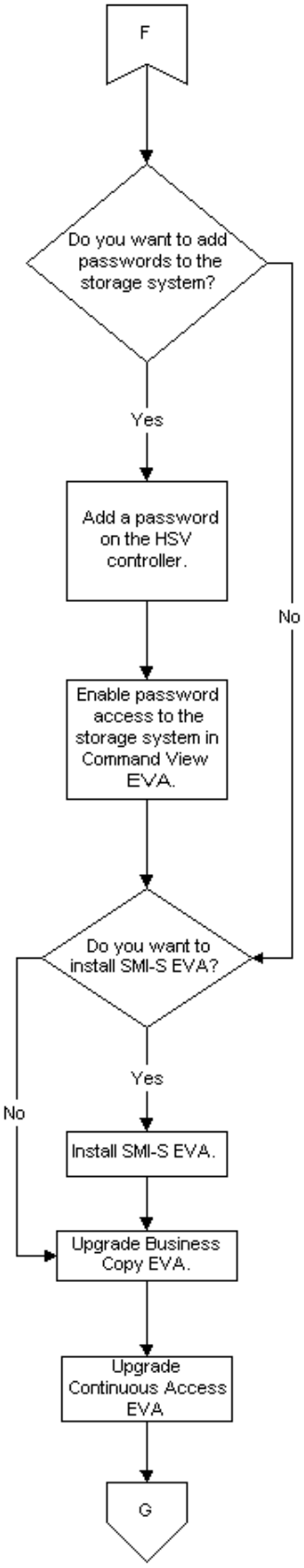
Flowchart 4


D
Stop Command View EVA on the Storage Management Appliance.
Choose the Command View EVA installation method.
Install Command View EVA v3.1.
Launch Command View EVA .
Verify the software version.
Is the version correct?
No
Yes
E

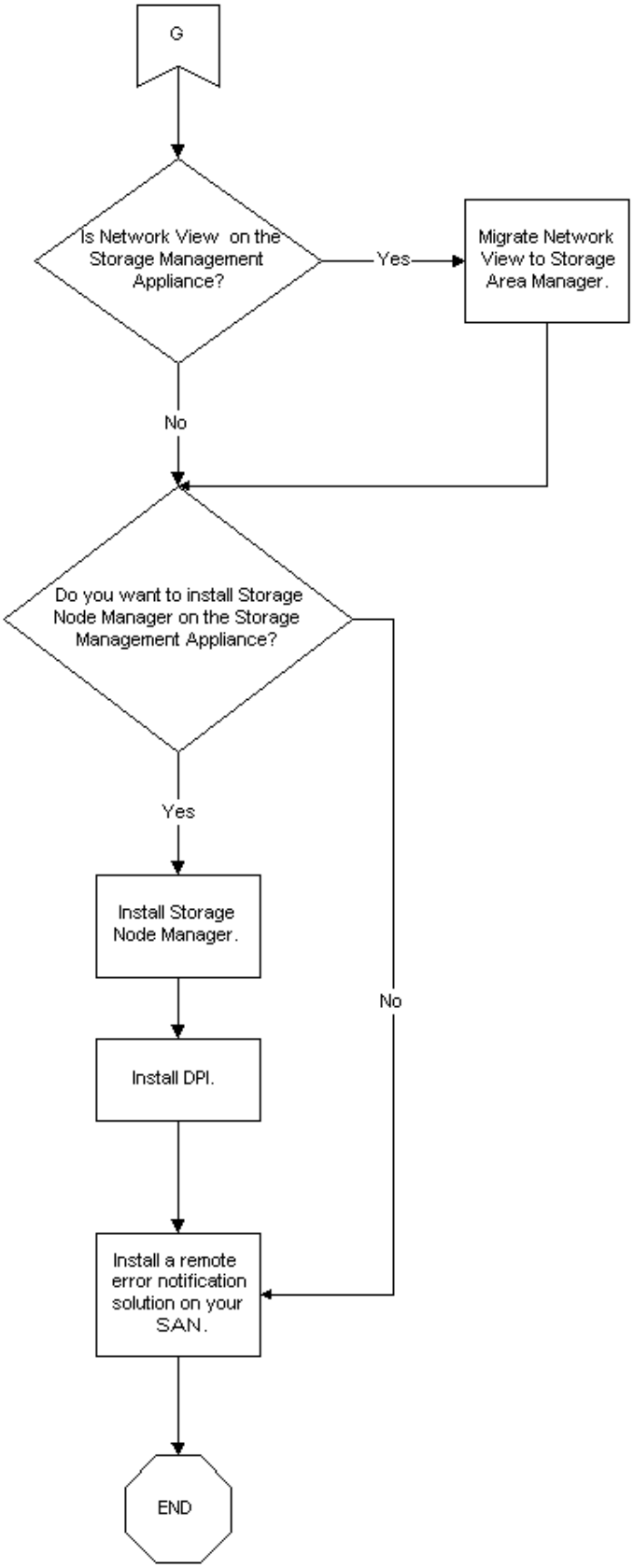
Flowchart 5


E
Update your Internet browser and JRE.
Load the add-on license keys.
Are you performing an online upgrade or an offline upgrade of the storage system software?
Offline
Stop all application I/O to the storage system.
Online
Load the new storage system software.
Verify the software version.
No
Is the version correct?
Yes
F

Flowchart 6


F
Do you want to add passwords to the storage system?
Yes
No
Add a password on the HSV controller.
Enable password access to the storage system in Command View EVA.
Do you want to install SMI-S EVA?
Yes
No
Install SMI-S EVA.
Upgrade Business Copy EVA.
Upgrade Continuous Access EVA
G

Flowchart 7


G
Is Network View on the Storage Management Appliance?
Yes
Migrate Network View to Storage Area Manager.
No
Do you want to install Storage Node Manager on the Storage Management Appliance?
Yes
No
Install Storage Node Manager.
Install DPI.
Install a remote error notification solution on your SAN.
END

Flowchart 8

Software Version Worksheet

B

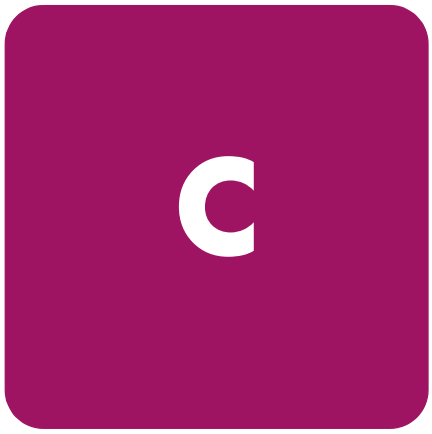
As you perform the procedures in this guide, use Table 13 in this appendix to record the necessary software version information and track your product upgrade.

Table 13: Software Version Worksheet

	Current Version	Required Version	Version After Upgrade	Installation Successful?
Storage Management Appliance Software				
Command View EVA				
Internet Browser				
JRE				
Business Copy EVA license key				
Continuous Access EVA license key				
Virtual Controller Software				
EMU firmware				

Notes

Storage System Description



This appendix provides an overview of the Enterprise Virtual Array and its components. It contains the following sections:

Introduction

The HP StorageWorks Enterprise Virtual Array is a high performance, scaled capacity on demand, "virtual" RAID storage solution. A complement of the current modular array family of StorageWorks solutions (ma8000 / ema12000 / ema16000), it can co-exist in the same Fibre Channel SAN, while providing 2-Gbps end-to-end Fibre Channel technology readiness.

This storage system is designed for the data center where improved storage use and scalability are critical. It meets application-specific demands for consistently high transaction I/O (input/output) and MB data rate performance, and provides seamless capacity expansion, instantaneous replication, and simplified storage administration.

The Enterprise Virtual Array is available with multiple configurations in 41U or 42U racks. Each configuration is optimized for general-purpose commercial environments and high-performance technical computing environments. The solutions include support for multivendor operating system platforms and stringent data center availability enhancements, such as multipathing and clustering. Refer to the *HP StorageWorks Enterprise Virtual Array v3.010 Release Notes* for information on supported operating systems, Fibre Channel adapters, driver firmware versions, and other support data.

Figure 54 shows a 2C12D configuration in a 41U rack.

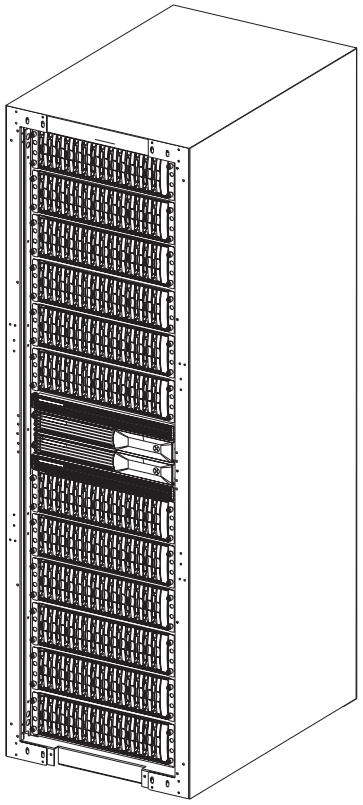


Figure 54: Enterprise Virtual Array 2C12D configuration

Key Features and Benefits

The Enterprise Virtual Array provides the following features:

- Outstanding self-tuning performance:
  - Virtualization technology, Vraid, enables data to be distributed from 8 to 240 disks to increase disk spindle count far beyond traditional RAID sets. This virtualization method also optimizes storage for the best performance of a specific configuration and application. The Enterprise Virtual Array eliminates tedious management functions to provide the best performance possible.
- State-of-the-art controller software:
  - Improves performance, increases capacity, and allows for easy dynamic storage expansion.
- High-density packaging and support of more disks per controller pair:
  - Up to 24 TB of storage in a single 41U or 42U rack.
  - Up to 35 TB using 240 disks per controller pair.
- Vsnap - Virtually Capacity-Free Snapshot:
  - Replicate data instantly by taking a logical picture of the data, without reserving an equal amount of capacity. This process saves significant disk space and improves disk efficiency.
- Virtually Instantaneous Snapclone:
  - Makes a complete copy of your data, which is accessible before the copy completes. The copied data can be used as a test platform for application changes and additional performance benchmarking.
- Integrated configurations:
  - Completely integrated configurations with a single part number, plus disk drives, VCS, and system platform software kits.
- Easy-to-use storage management tools:
  - Software tools that allow you to manage larger SAN configurations with more servers and more storage solutions.

Storage System Components

This section contains the following topics:

The Enterprise Virtual Array consists of three main components:

- Command View EVA—The user interface that communicates with the controllers. Together, Command View EVA and the controllers control and monitor Enterprise Virtual Array storage systems.
- VCS—Virtual Controller Software that allows the Enterprise Virtual Array to communicate with Command View EVA, via the controllers.
- Hardware—The physical pieces that constitute the Enterprise Virtual Array, such as drives, enclosures, and controllers. These pieces are combined in a rack and are connected to the SAN.

These components work together to create an entire storage system solution that stores your data. Management is accomplished by accessing Command View EVA through your browser.

Figure 55 shows the complete Enterprise Virtual Array storage solution.

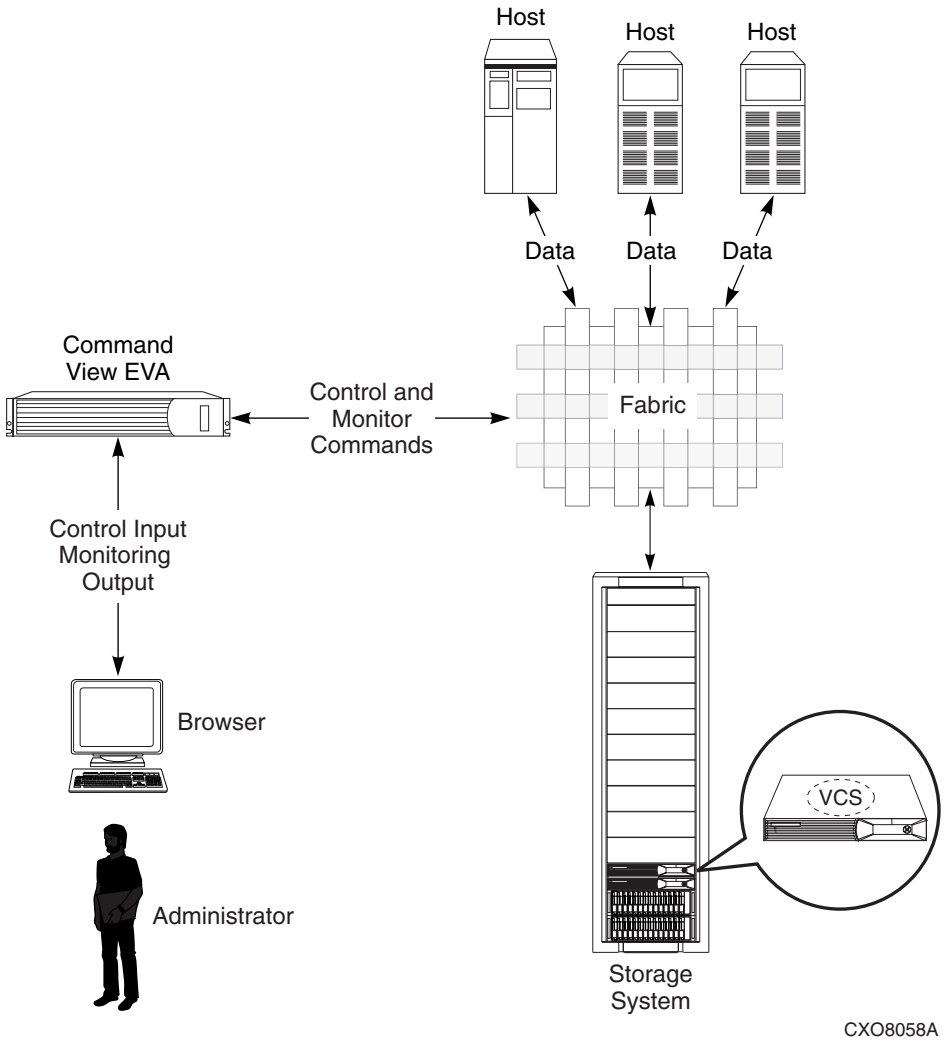


Figure 55: Enterprise Virtual Array storage solution

Command View EVA

The only user interface to the Enterprise Virtual Array, Command View EVA resides on the HP OpenView Storage Management Appliance (management appliance) and is opened via a Web browser. It is used to perform all virtual storage pool administrative tasks. These tasks include:

- Creating virtual disk families, including selection of Vraid level, cache policy, and host presentation.
- Managing the presentation of Vraid drives to hosts.
- Managing system hardware located in the rack.
- Creating snapclones and snapshots of virtual disks.

An online help system is available within the interface, including page-level help.

Interface Layout

The interface is divided into three panes:

- Session pane—located across the top of the window. It contains high-level commands and the name and IP address of the Storage Management Appliance.
- Navigation pane—located on the left side of the window. It contains a tree structure for access to virtual disks, hosts, and other elements of the Enterprise Virtual Array.
- Content pane—located on the right side of the window, below the Session pane. It is the largest window and is where most administrative tasks are performed.

Figure 56 shows a Command View EVA interface window.

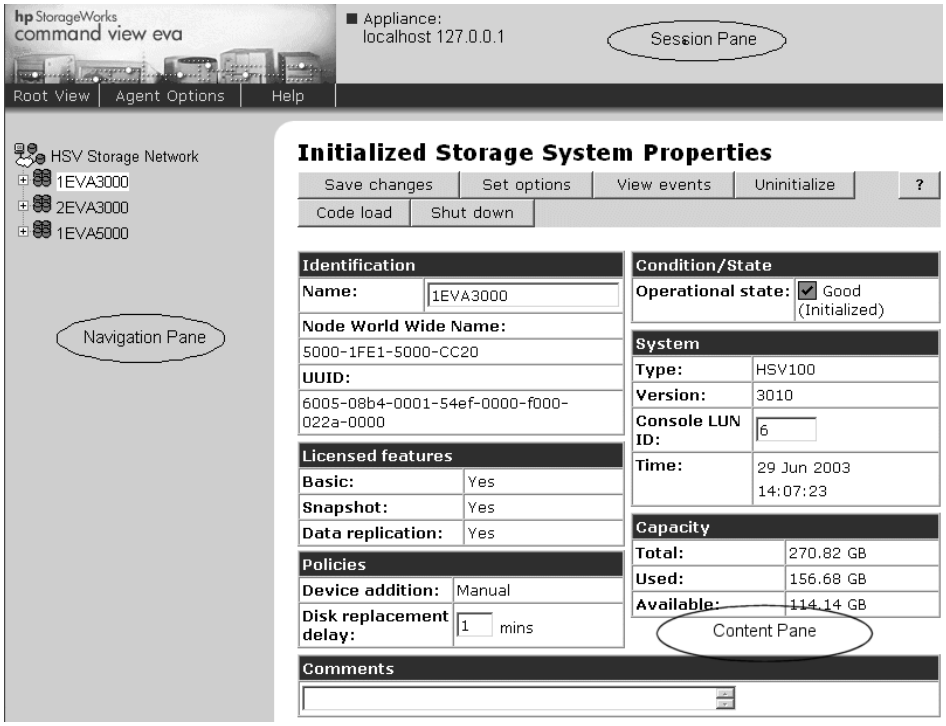


Figure 56: Command View EVA interface window

For more information, see the *HP StorageWorks Enterprise Virtual Array User Guide*.

Command View EVA Online Help

You will find an extensive online help system for Command View EVA. Three levels of help are available:

1. Application—Activated by clicking **Help** on the Session pane. Application help includes:
   - Navigation by a table of contents
   - Index
   - Keyword search function
2. Page—Activated by clicking the **?** button in the Content pane
3. Field—Activated by clicking the **?** symbol, when displayed next to a field.

Virtual Controller Software

VCS provides storage controller software capability and is provided in the HP StorageWorks Virtual Controller Software kit.

VCS Benefits

VCS provides scalable capacity on-demand, helps improve performance, increases disk utilization efficiency, and allows for easy dynamic storage expansion by providing the following features:

- High-density packaging and support of more disks per controller pair. Up to 24TB of disk storage in approximately 5.9 square feet (0.5 square meters) using 168 disks.
- Virtually Capacity-Free Snapshot (Vsnap) function that saves significant disk space and improves disk utilization efficiency.
- Virtually Instantaneous Snapclone copy capability that allows immediate use of the clone copy.
- Simplified storage management, such as server-independent storage management, automatic load balancing, and on-the-fly storage expansion to multiply management efficiency up to 15 times.

VCS Features and Functionality

VCS provides the following capabilities:

- Support for up to 240 disk drives per controller pair
- Management of up to 512 virtual disks, ranging in size from 1 GB to 2 TB per virtual disk, per disk pool
- Dynamic capacity expansion and virtual disk data load leveling
- Distributed sparing of disk capacity
- Virtually Capacity-Free Snapshot (Vsnap)
- Virtually Instantaneous Snapclone
- Dual redundant controller operation for increased fault tolerance
- Multiple path failover support
- Battery back-up for cache memory
- Asynchronous disk swap (Hot Swap)
- Clustered server support
- Mirrored write-back cache support
- Read-ahead and adaptive read caching support
- Virtual RAID arrays (Vraid0, Vraid1, Vraid5)
- Non-disruptive software upgrade capability
- Supports connection of up to 256 hosts
- Multivendor platform support
- Controller password protection for configuration control
- Selective storage presentation
- SAN-based data zoning

Additional information about HP StorageWorks Virtual Controller Software can be found online at: http://h18000.www1.hp.com/storage/index.html.

Hardware

The Enterprise Virtual Array consists of the following hardware components:

- Fibre Channel drive enclosure—A unit that holds storage system devices, such as disk drives, power supplies, blowers, Input/Output (I/O) modules, transceivers, and an Environmental Monitoring Unit (EMU).
- Fibre Channel loop switch—An enclosure that provides twelve-port central interconnect for Fibre Channel Arbitrated Loops (FC-AL), following the ANSI FC-AL standard.
- Controller—A hardware or firmware device that manages communications between host systems and other devices. A pair of controllers is included in the Enterprise Virtual Array.
- Rack—A floor-standing structure designed for, and capable of, holding and supporting storage system equipment.

Note: Your Enterprise Virtual Array may consist of one or more of the above hardware elements, depending on your configuration.

Physical Layout of the Storage System

Physically, the Enterprise Virtual Array consists of a pair of controllers and an array of disk drives. The basic physical components are shown in Figure 57. The disk drives connect to drive enclosures, which plug into Fibre Channel (FC) loop switches. The controller pair is cabled to the FC loop switches. A backplane in the drive enclosures distributes commands and data to the drives.

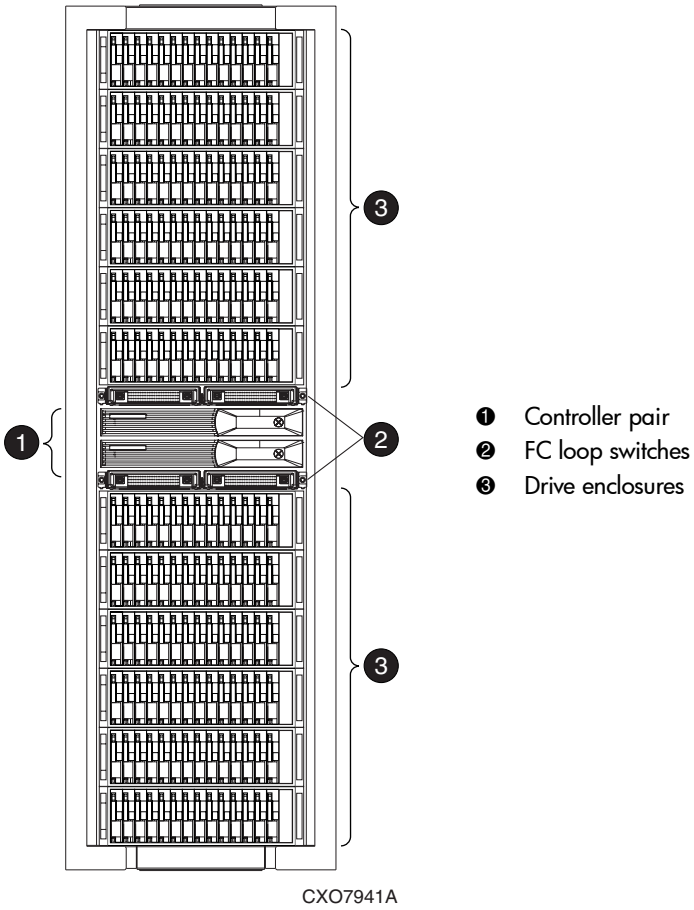


Figure 57: Basic storage system hardware components in a 41U rack

Each hardware component is identified in the following sections, and is described in detail in Chapter 4 of the *HP StorageWorks Enterprise Virtual Array User Guide*.

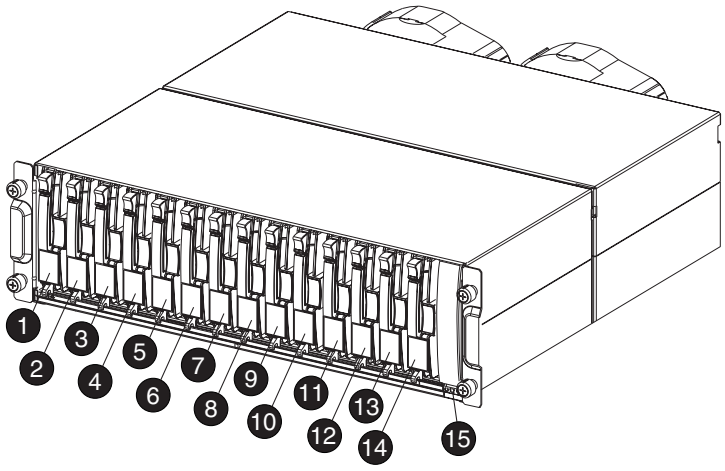
Fibre Channel Drive Enclosure

Each FC drive enclosure includes the following features:

- 3U drive enclosure
- Dual-redundant, active-to-active, 2-Gbps FC loops
- Fourteen 1-inch FC disks per enclosure
- EMU
- Dual 2-Gbps FC I/O modules—A and B loops
  - — Enhanced fault detection.
  - — Single Gigabit Interface Converter (GBIC)
- Dual 500-W redundant hot-plug power supplies and blowers

For ease of reference, the disk drives are referred to by their physical location, the drive bay number.

Figure 58 shows the front view of the FC drive enclosure and the physical location of each drive bay.



❶ to ⓮ drive bays, ⓯ enclosure status icons

Figure 58: FC drive enclosure

Fibre Channel Loop Switches

The Enterprise Virtual Array uses four FC loop switches to connect all of the drive enclosures to the controller pair via FC cables. Each switch acts as a central point of interconnection and establishes a fault-tolerant physical loop topology.

The major features of the FC loop switches are:

- 2.125 Gbps operating speed
- Twelve ports
- Half-width, 1U size
- System and port status LED indicators
- Universal power supply that operates between 100 to 250 VAC and 50 to 60 Hz
- Small Form-factor Pluggable (SFP) transceivers

Figure 59 shows the bezel and front view of the FC loop switch.

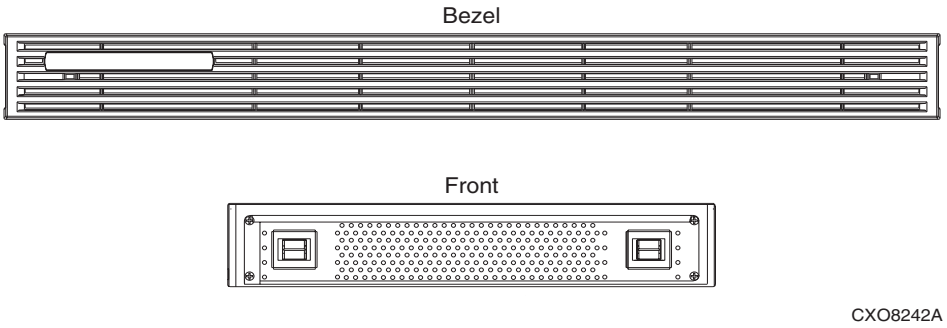


Figure 59: FC loop switch—bezel and front view

Note: Each bezel covers two FC loop switches in a space capacity of 1U. One "U" is 44.45 mm (1.75 inches) high.

HSV110 Controllers

Two high-performance controllers are contained in one rack. Each controller is contained in a separate enclosure and features:

- High performance microprocessor
- An Operator Control Panel (OCP) for easy operation
- Two 2-Gbps Fibre Channel-Switched Fabric host ports
- Four 2-Gbps FC-AL device ports
  - — Arranged in redundant pairs
  - — Data load/performance is balanced across a pair
  - — Supports up to 240 disks (120 disks per pair)
- 1-GB cache per controller, mirrored, with battery backup
- 2-Gbps FC cache mirroring port with device port backups
- Dual power supplies

The controller is the interface between Command View EVA and the Enterprise Virtual Array (the interface between hosts and disks). It is the interface to your data and performs I/O correctly and reliably. Up to 18 disk drive enclosures are supported by one HSV110 controller pair.

Each controller pair consists of two controllers. Figure 60 shows the controllers as they reside in the storage system.

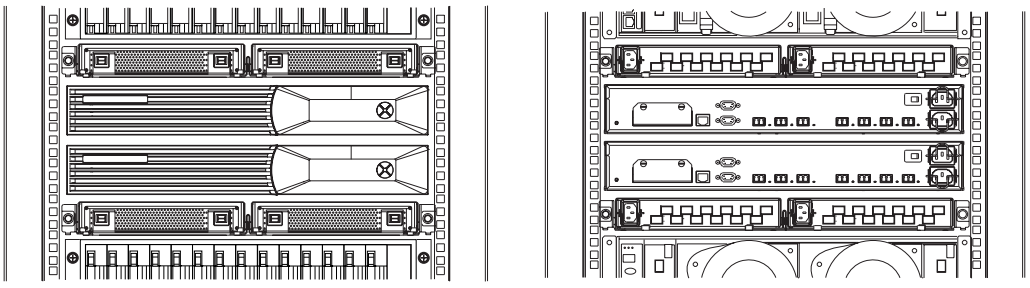


Figure 60: Controller location—front and rear views

Rack

The rack provides the capability for mounting standard 483 mm (19 in) wide controller and drive enclosures.

Three types of racks are available with your Enterprise Virtual Array:

- 9000-Series 42U rack—Available in graphite with a depth of 909mm (35.8 in) with industry standard 19-in mounting rails.
- 9000-Series 41U rack—Available in graphite with a depth of 993mm (39.1 in) with industry standard 19-in mounting rails.
- 10000-Series 42U rack—Available in graphite with a depth of 1000mm (39.4 in) with industry standard 19-in mounting rails.

Note: Racks and rack-mountable components are typically described using "U" measurements.

The racks provide the following:

- Unique frame and rail design—Allows fast assembly, easy mounting and outstanding structural integrity.
- Thermal integrity—Front-to-back natural convection cooling is greatly enhanced by the innovative multiangled design of the front door.
- Security provisions—The front and rear door are lockable, which prevents unauthorized entry
- Flexibility—Provides easy access to hardware components for operation monitoring.
- Custom expandability—Several options allow for quick and easy expansion of the racks to create a custom solution.
- Housing for all storage system components, including:
  - Cables
  - FC drive enclosures
  - FC loop switches
  - Controllers
  - Power Distribution Units (PDUs)

Figure 61 shows the 42U rack.

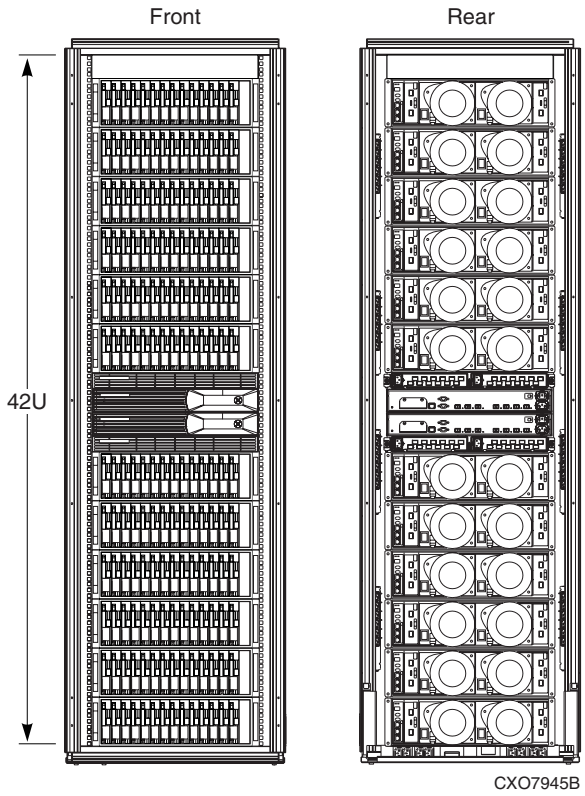


Figure 61: 42U rack

Figure 62 shows the 41U rack.

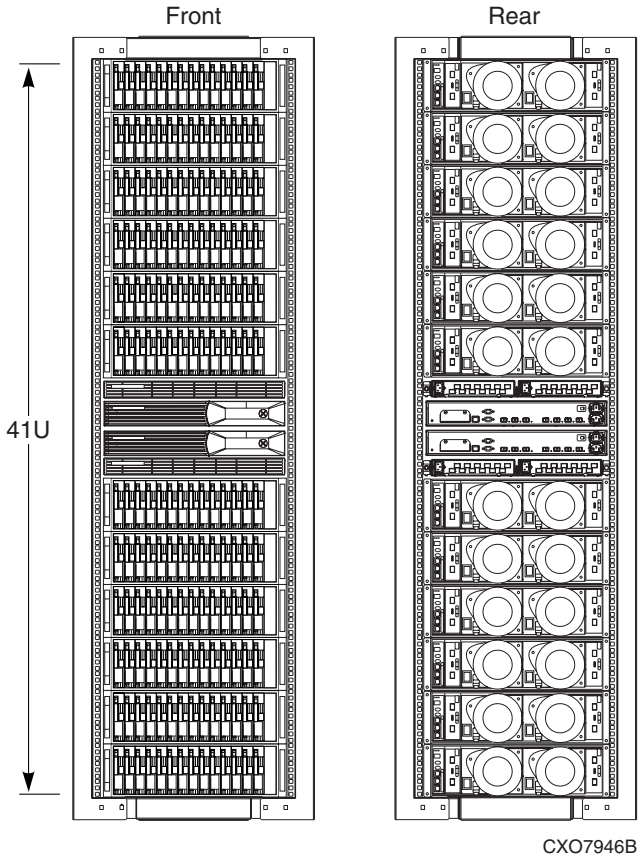


Figure 62: 41U rack

glossary

This glossary defines terms used in this guide or related to this product and is not a comprehensive glossary of computer terms.

active member of a virtual disk family
An active member of a virtual disk family is a simulated disk drive created by the controllers as storage for one or more hosts. An active member of a virtual disk family is accessible by one or more hosts for normal storage. An active virtual disk member and its snapshot, if one exists, constitute a virtual disk family. An active member of a virtual disk family is the only necessary member of a virtual disk family.

Command View EVA
The graphical user interface (GUI) through which a user can control and monitor a storage system. Command View EVA can be installed on more than one storage management appliance in a fabric. Each installation is a management agent. The client for the agent is a standard Web browser.

controller event
A significant occurrence involving any storage system hardware or software component reported by the controller to Command View EVA.

controller
A hardware/firmware device that manages communications between host systems and other devices. Controllers typically differ by the type of interface to the host and provide functions beyond those the devices support.

controller pair
Two interconnected controller modules which together control a physical disk array. A controller pair and the disk array together constitute a storage system.

corrective action code
A Command View EVA graphical user interface (GUI) display component that defines the action required to correct a problem.

CRITICAL Condition
A disk drive enclosure EMU condition that occurs when one or more disk drive enclosure elements have failed or are operating outside of their specifications. The failure of the element makes continued normal operation of at least some elements in the enclosure impossible. Some enclosure elements may be able to continue normal operations. Only an UNRECOVERABLE condition has precedence. This condition has precedence over NONCRITICAL errors and INFORMATION condition.

disk group
A physical disk drive set or pool in which a virtual disk is created. A disk group may contain all the physical disk drives in a controller pair array or a subset of the array.

disk drive enclosure event
A significant operational occurrence involving a hardware or software component in the disk drive enclosure. The disk drive enclosure EMU reports these events to the controller for processing.

disk drive enclosure
A unit that holds storage system devices such as disk drives, power supplies, blowers, I/O modules, transceivers, or EMUs.

EIP
Event Information Packet. The event information packet is an HSV element hexadecimal character display that defines how an event was detected. *Also* called the EIP type.

Element Manager GUI
The graphical user interface (GUI) through which a user can control and monitor a storage system. Command View EVA can be installed on more than one storage management appliance in a fabric. Each installation is a management agent. The client for the agent is a standard Web browser.

element
1. In a disk drive enclosure, a device such as an EMU, power supply, disk, blower, or I/O module. The object can be controlled, interrogated, or described by the enclosure services process.
2. In the Storage Management Appliance software, a controllable object, such as the Enterprise storage system.

EMU
Environmental Monitoring Unit. An element which monitors the status of an enclosure, including the power, air temperature, and blower status. The EMU detects problems and displays and reports these conditions to a user and the controller. In some cases, the EMU implements corrective actions.

enclosure
A unit used to hold various storage system devices, such as disk drives, controllers, power supplies, an EMU, I/O modules, or blowers.

Enterprise Virtual Array rack
A unit that holds controller enclosures, disk drive enclosures, power distribution supplies, and enclosure address buses that, combined, comprise an Enterprise storage system solution. *Also* called the Enterprise storage system rack.

See also **rack.**

Enterprise Virtual Array
The Enterprise Virtual Array is a product that consists of one or more storage systems. Each storage system consists of a pair of HSV controllers and the disk drives they manage. A storage system within the Enterprise Virtual Array can be formally referred to as an Enterprise storage system, or generically referred to as the storage system.

event
Any significant change in the state of the Enterprise Storage System hardware or software component reported by the controller to Command View EVA.

See also **controller event, disk drive enclosure event, management agent event,** *and* **termination event.**

fabric
A Fibre Channel fabric switch or two or more interconnected Fibre Channel switches that allow data transmission.

Fibre Channel
A data transfer architecture designed for mass storage devices and other peripheral devices that require very high bandwidth.

Gb
Gigabit. A measurement of the rate at which the transfer of bits of data occurs. Sometimes referred to as Gbps. Nominally, a Gb is a transfer rate of 1,000,000,000 (10^9) bits per second.

For Fibre Channel transceivers or FC loops the Gb transfer rates are:

- 1 Gb is a transmission rate of 1,062,500,000 bits per second.
- 2 Gb is a transmission rate of 2,125,000,000 bits per second.

GUI
Graphical User Interface. Software that displays the status of a storage system and allows its user to control the storage system.

host
A computer that runs user applications and uses (or can potentially use) one or more virtual disks created and presented by the controller pair.

HSV Element Manager
The graphical user interface (GUI) through which a user can control and monitor a storage system. HSV Element Manager can be installed on more than one storage management appliance in a fabric. Each installation is a management agent. The client for the agent is a standard Web browser. Versions later than 2.0 are called Command View EVA.

I/O module
Input/Output module. The enclosure element that is the FC-AL interface to the host or controller. I/O modules are bus speed specific, either 1 Gb or 2 Gb.

initialization
A process that prepares a storage system for use. Specifically, the system binds the controllers together as an operational pair and establishes preliminary data structures on the disk array. Initialization also sets up the first disk group, called the default disk group.

LED
Light Emitting Diode. A semiconductor diode, used in an electronic display, that emits light when a voltage is applied to it.

license key
A WWN-encoded sequence that is obtained from the license key fulfillment website.

logon
Also called login, a procedure whereby a user or network connection is identified as being an authorized network user or participant.

management agent event
A significant occurrence to or within the management agent software, or an initialized storage cell controlled or monitored by the management agent.

management agent
The Command View EVA software that controls and monitors the Enterprise Storage System. The software can exist on more than one management appliance in a fabric. Each installation is a management agent.

metadata
Information that a controller pair writes on the disk array. This information is used to control and monitor the array and is not readable by the host.

OCP
Operator Control Panel. The element that displays the controller's status using LEDs and an LCD. Information selection and data entry is controlled by the OCP pushbuttons.

online upgrade
During an online upgrade of the storage system software, VCS is upgraded on the HSV controllers, while they are still receiving I/O from the applications on the host servers. During a VCS upgrade, the HSV controllers do reboot at the same time.

OpenView Storage Management Appliance Software
A centralized, appliance-based monitoring and management interface that supports multiple applications, operating systems, hardware platforms, storage systems, tape libraries, and SAN-related interconnect devices. It is included in, and resides on, the OpenView Storage Management Appliance, a single aggregation point for data management.

password
A security interlock where the purpose is to allow:

- A management agent to control only certain storage systems
- Only certain management agents to control a storage system.

physical disk
A disk drive mounted in a disk drive enclosure that communicates with a controller pair through the device-side Fibre Channel loops. A physical disk is hardware with embedded software, as opposed to a virtual disk, which is constructed by the controllers. Only the controllers can communicate directly with the physical disks.

The physical disks, in aggregate, are called the array and constitute the storage pool from which the controllers create virtual disks.

push button
A switch that is engaged or disengaged when it is pressed.

rack
A floor-standing structure primarily designed for, and capable of, holding and supporting storage system equipment. All racks provide for the mounting of panels per Electronic Industries Alliance (EIA) *Standard RS-310-C*.

SAN
Storage Area Network.

snapshot
A temporary virtual disk (Vdisk) that reflects the contents of another virtual disk at a particular point in time. A snapshot operation is only done on an active virtual disk. Up to seven snapshots of an active virtual disk can exist at any point. The active disk and its snapshot constitute a virtual family.

storage system software
The storage system software consists of VCS and EMU firmware.

termination event
An occurrences that causes the storage system to cease operation.

uninitialized system
A state in which the storage system is not ready for use.

See also **initialization.**

VCS
Virtual Controller Software. Provides storage controller software capability for the HSV controller.

Vdisk
Virtual Disk. A simulated disk drive created by the controllers as storage for one or more hosts. The virtual disk characteristics, chosen by the storage administrator, provide a specific combination of capacity, availability, performance, and accessibility. A controller pair simulates the characteristics of the virtual disk by deploying the disk group from which the virtual disk was created.

The host computer sees the virtual disk as “real,” with the characteristics of an identical physical disk.

virtual disk family
A grouping that consists of a virtual disk and its snapshot, if a snapshot exists. The original virtual disk is called the active disk. When you first create a virtual disk family, the only member is the active disk.

Vraid0
A virtualization technique that provides no data protection. A data host is broken down into chunks and distributed on the disks comprising the disk group from which the virtual disk was created. Reading and writing to a Vraid0 virtual disk is very fast and makes the fullest use of the available storage, but there is no data protection (redundancy) unless there is parity.

Vraid1
A virtualization technique that provides the highest level of data protection. All data blocks are mirrored or written twice on separate physical disks. For read requests, the block can be read from either disk, which can increase performance. Mirroring takes the most storage space because twice the storage capacity must be allocated for a given amount of data.

Vraid5
A virtualization technique that uses parity striping to provide moderate data protection. Parity is a data protection mechanism for a striped virtual disk. A striped virtual disk is one where the data to and from the host is broken down into chunks and distributed on the physical disks comprising the disk group in which the virtual disk was created. If the striped virtual disk has parity, another chunk (a parity chunk) is calculated from the set of data chunks and written to the physical disks. If one of the data chunks becomes corrupted, the data can be reconstructed from the parity chunk and the remaining data chunks.

WWN
World Wide Name. A unique Fibre Channel identifier consisting of a 16-character hexadecimal number. A WWN is required for each Fibre Channel communication port.

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